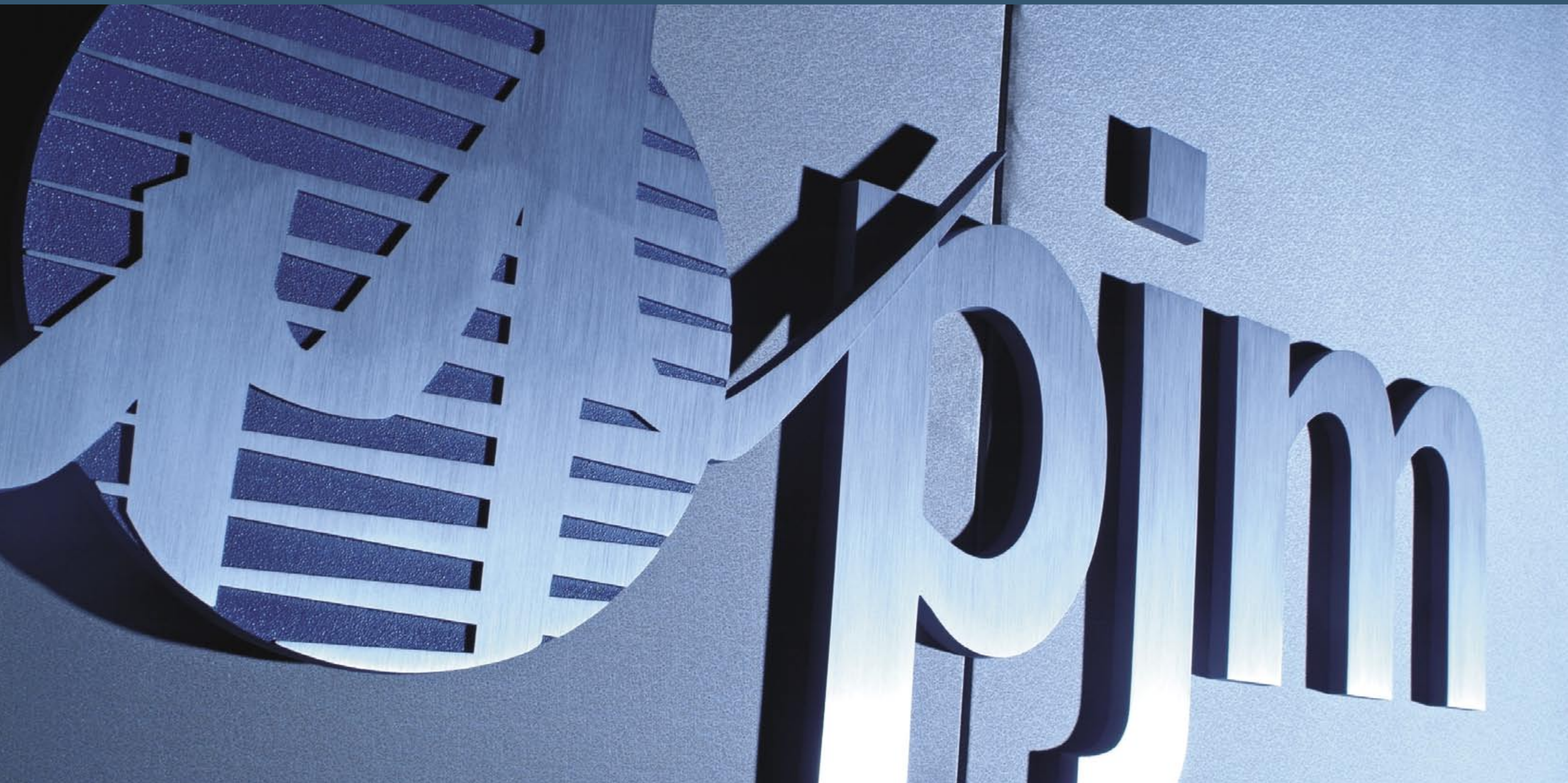
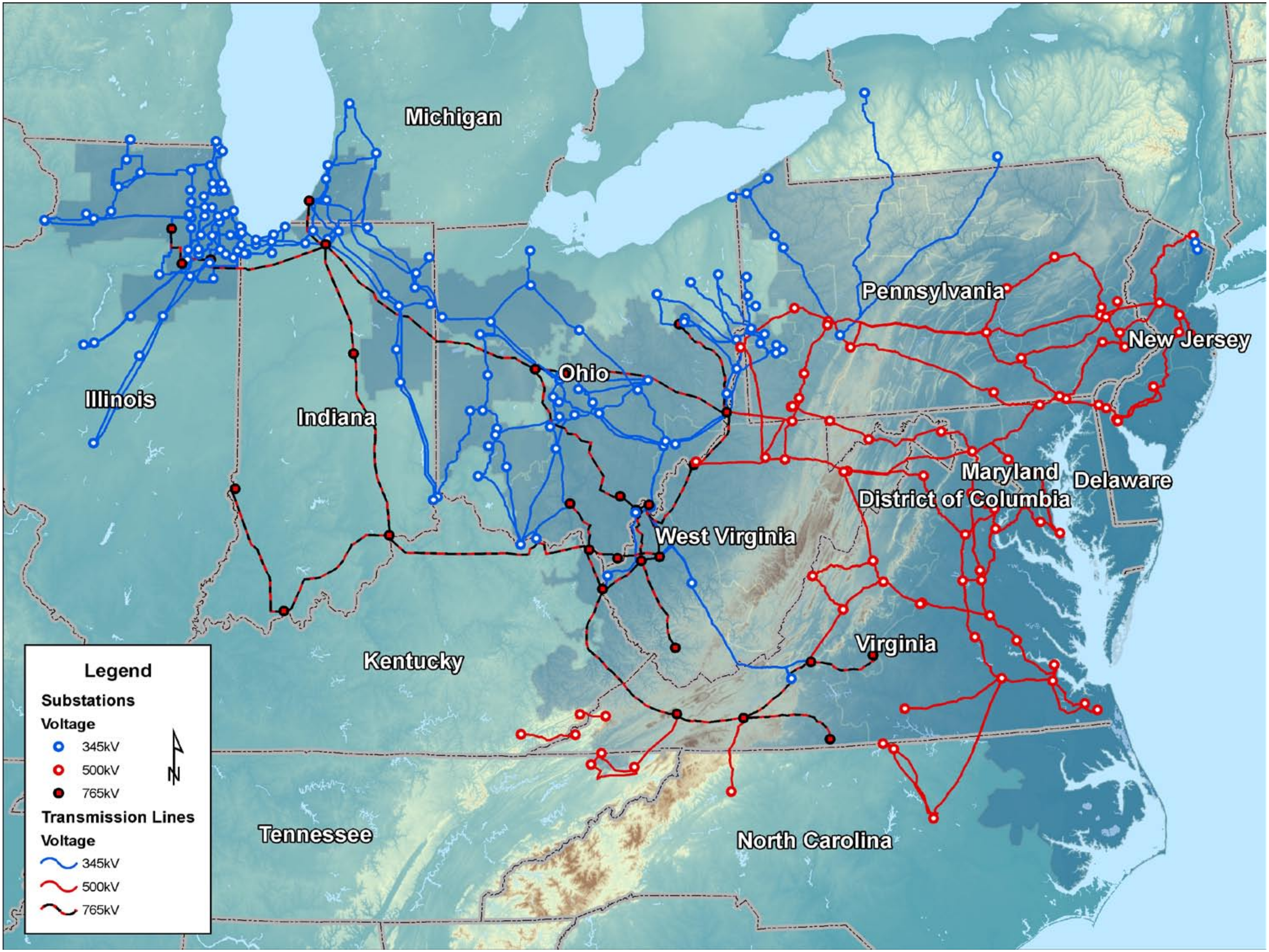


PJM Regional Transmission Expansion Plan

February 22, 2006


Michigan
Illinois
Indiana
Ohio
Pennsylvania
New Jersey
Maryland
Delaware
District of Columbia
West Virginia
Virginia
Kentucky
Tennessee
North Carolina
Legend
Substations
Voltage
345kV
500kV
765kV
Transmission Lines
Voltage
345kV
500kV
765kV
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Preface: What This Document Conveys

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PJM's comprehensive RTEP Process examines the three interrelated components of electric power system reliability: load, generation and transmission, together the 'three-legged stool' of reliability. PJM's RTEP Process employs a range of planning study tools and methodologies to analyze and assess each leg of the stool to ensure that reliability remains on firm footing. This enables PJM to meet established reliability criteria, keep markets robust and competitive, and ensure stable operations.

Goal of the Report

The goal of this RTEP Report is to convey not only the results of planning studies, but, also, the rationale behind why such upgrades are needed. PJM has crafted this report in particular for federal and state regulators and their staffs to explain and emphasize the link among system drivers (e.g., load growth, generation activity), system limitations (e.g., transmission constraints) and the need for identified system upgrades (e.g., new facilities, upgrades to existing facilities, etc.)

Scope of Upgrades Discussed

To date, the RTEP upgrades recommended by PJM and approved by the PJM Board has numbered in excess of 700. However, to put reasonable parameters around the scope and length of this report, the upgrades discussed here are generally those whose individual cost exceeds $1 million dollars. A complete list of all upgrades can be found in the Planning section of www.pjm.com.

Queued Interconnection Requests

From the perspective of generation and merchant transmission interconnection requests, (a key part of PJM's RTEP Process) the upgrades discussed in this report only cover interconnection requests in PJM Queue A through Queue N. This is important to note because PJM's interconnection request process is ongoing. Thus, although transmission upgrades required by interconnection requests in queues A through N are discussed in this report, PJM has included in many other tables throughout the report statistical information about queue activity in Queue O and Queue P. (Queue P itself closed on January 31, 2006.) Interconnection requests in Queue O and Queue P are still in early study phases and are scheduled to be included in RTEP upgrades to be recommended to the PJM Board in the second quarter of 2006.

For additional RTEP Process information…

For more detailed information on the RTEP Process itself, the reader is directed to the following sources found on-line at www.pjm.com:

1. The PJM Operating Agreement, Schedule 6, codifies the provisions under which PJM executes its Regional Transmission Expansion Planning Protocol, more familiarly known (and used throughout this document) as the "PJM RTEP Process."

2. The PJM Open Access Transmission Tariff (OATT), Part IV describes the interconnection process for new generating resource interconnection and merchant transmission interconnection requests.

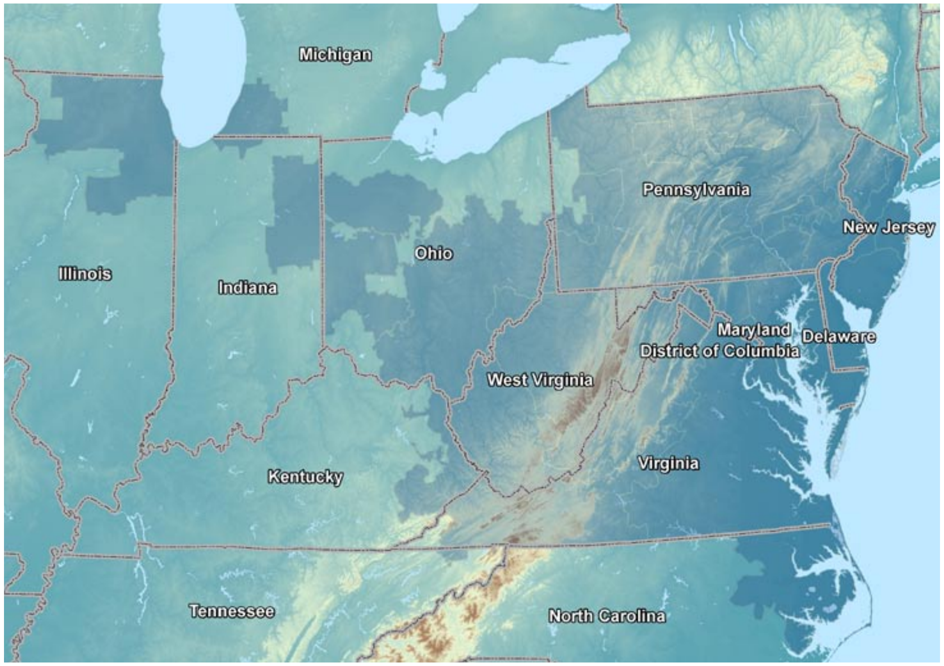
3. The M-14 series of PJM Manuals which describe the specific "business rules" under which PJM effects the entire RTEP Process from start to finish.

Section 1: Executive Summary

PJM | DE | DC | IL | IN | KY | MD | MI | NJ | NC | OH | PA | TN | VA | WV

PJM's Regional Transmission Expansion Plan (RTEP) identifies transmission system upgrades and enhancements to provide for the operational, economic and reliability requirements of PJM customers. A region-wide planning effort, the RTEP determines the best way to integrate transmission with generation and load response projects to meet load-serving obligations. PJM currently applies planning and reliability criteria over a five-year horizon to identify transmission constraints and other reliability concerns. Transmission upgrades and other projects that can mitigate identified issues are then examined for their feasibility, impact and costs, culminating in one plan for the entire PJM footprint.

Through December 2005, more than $1.8 billion of transmission expansion projects have been identified in the RTEP Plan to meet the challenges of many system drivers: load growth, generation and merchant transmission interconnection requests, congestion, generator deactivations and operational performance.



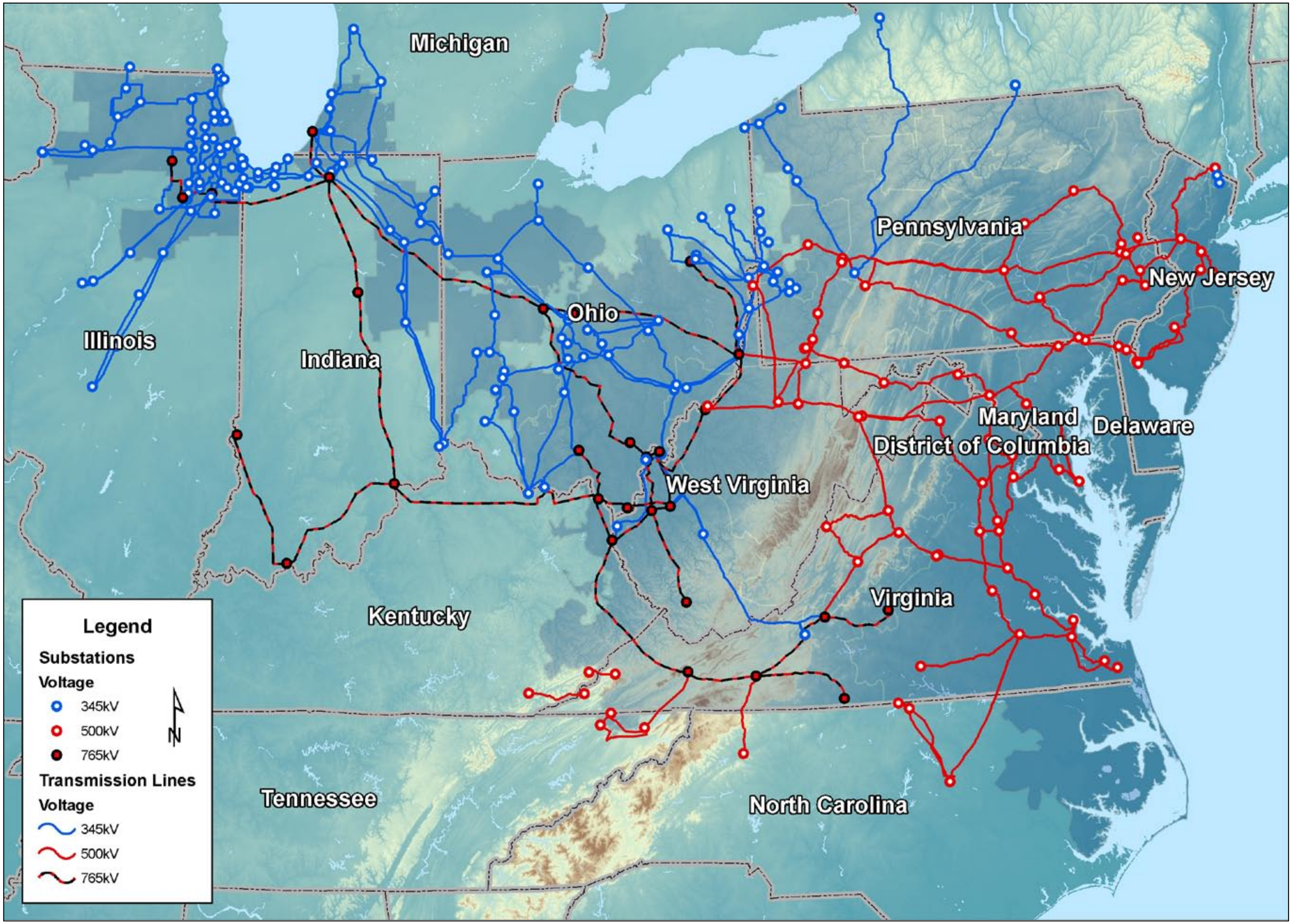
Scope of PJM's Footprint

PJM Interconnection is a regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia, as shown in **Map 1-1** on the following page.

Serving approximately 51 million people, PJM encompasses major U.S. load centers from Illinois' western border to the Atlantic coast, including the metropolitan areas in and around Baltimore, Chicago, Columbus, Dayton, Newark and northern New Jersey, Norfolk, Philadelphia, Pittsburgh, Richmond and Washington D.C.

Collaborating with more than 390 members, PJM dispatches more than 164,000 megawatts of generation capacity over more than 56,000 miles of transmission lines – a system that serves nearly 20 percent of the U.S. economy. PJM's footprint includes many key transmission arteries of the U.S. Eastern Interconnection. PJM's interstate geography and electrical topography provide its members access not only to PJM's regional power markets but also to those of adjoining systems west, northeast and south of PJM's borders.

Map 1-1: PJM Backbone Transmission System



Single-Entity Planning

PJM is a federally regulated Regional Transmission Organization (RTO). As such, it acts independently and impartially in managing the interstate regional transmission system and the wholesale electricity market. As one of its core RTO functions, PJM manages a sophisticated regional planning process to ensure the continued load-serving reliability of the electric system.

Successful implementation of integrated planning takes into account markets and operations on a regional basis. PJM makes no distinction among owners and ignores boundaries between owners' systems, permitting consistent, pre-defined, objective treatment of all constituents throughout the planning process. PJM's ability to plan in this manner enhances reliability, considers all drivers of grid expansion and promotes the growth of operational benefits and market opportunities. This scope – both functional and geographical – enables PJM to develop a comprehensive, integrated expansion plan as described in this report.

Each new set of plans the PJM Board approves are not discretely self-contained nor independent of those plans previously approved by the Board. Each successive set of plans that the Board approves is organically integrated in to an existing single whole. In other words, all existing system elements, new enhancements and withdrawal of others are integrated into one plan.

Reliability is Fundamental

PJM's Regional Transmission Expansion Planning (RTEP) Process preserves the reliability of PJM's interstate transmission system to ensure that power continues to flow reliably to customers and that robust, competitive power markets continue to flourish. Fundamentally, no matter what the underlying driver of system expansion may be, the RTEP Process must ensure all system needs are met reliably.

Serving Load

Understanding PJM's RTEP requires a fundamental understanding that generation and transmission are inextricably linked with serving load. Sound regional planning is predicated on analyses and processes to integrate all three into one holistic plan.

PJM regional planning extends back many decades. A key component of that effort has always included assessing the ability of generating resources to meet the load-serving needs of members' customers. The plans which emerge from such assessments ensure that adequate generation and transmission are in place to meet load forecasts.

Planning for Adequate Generation

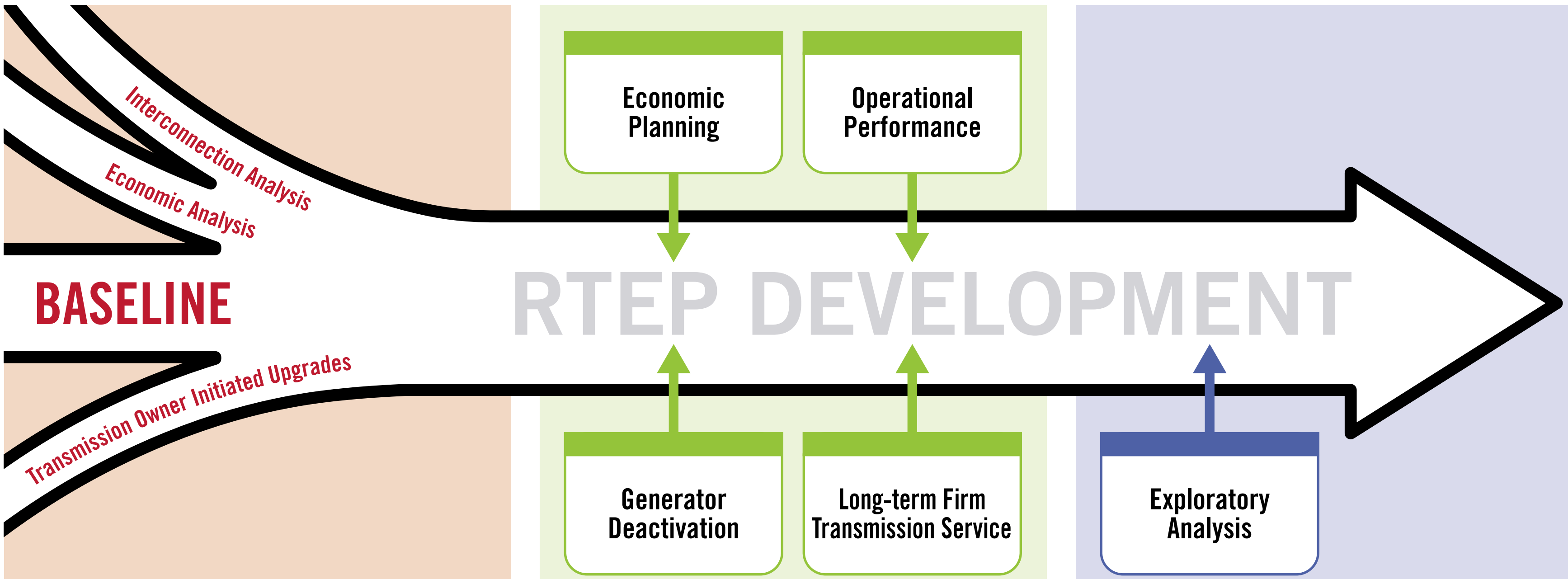
PJM's process ensures that generation is deliverable across sufficient transmission facility capability in order to meet a one-day-in-ten-years loss-of-load expectation standard across PJM. This has remained a pillar of system reliability even as PJM market-based operations have continued to evolve.

Planning to Ensure Transmission System Reliability

PJM's analytical processes – including thermal and voltage analysis, system stability, short circuit and other studies – yield recommendations to upgrade transmission facilities to maintain safe and reliable system operations in compliance with established reliability criteria. This remains the case whether such upgrades are driven by load growth, generation interconnection requests, merchant transmission interconnection requests, unhedgeable congestion, generation deactivation requirements or operational performance issues.

RTEP Development Process

Since its inception in 1997, PJM's RTEP Process has continued to adapt to the planning needs of an RTO with expanding evolving markets. Initially, PJM's RTEP consisted mainly of baseline grid upgrades driven by load growth and generating resource interconnection requests. Today, myriad other drivers are considered and PJM's RTEP is a synthesis of the outcomes of many sophisticated process analyses that examine these drivers.



Cyclical Planning

The regularly occurring phases of the RTEP Process:

Baseline Analysis – assess system response to forecasted load growth and other updates to individual TO system facility modeling parameters such as updates to line ratings.

Interconnection Analysis – to assess system response to new generation and merchant transmission resources and to identify required attachment facilities and network upgrades.

Economic Analysis – to identify and calculate gross congestion and unhedgeable congestion.

Transmission Owner Initiated Upgrades – to mitigate local TO issues, as proposed by TOs themselves.

Situational Planning

Derived from specific Cyclical Planning calculations and/or specific actual system events:

Economic Planning – to mitigate persistent unhedgeable congestion as calculated throughout the cyclical planning process.

Operational Performance – to address persistent real-time operational issues.

Generator Deactivation – studies to reflect retirement and other long-term limitations and restrictions on unit output such as those imposed by environmental requirements.

Long-term firm transmission service – studies to determine the ability of the system to accommodate firm transmission service requests.

Scenario Planning

Examines the long-term impacts of evolving system drivers on electrical system reliability and economy.

These can include probabilistic risk assessments, system sensitivity analyses and economic sensitivity studies.

PJM RTEP Summary – December 31, 2005

Each part of the planning process can reveal upgrades that fall into one of three categories based on the characteristic cost allocation mechanism for each:

1. **Baseline** upgrades are those which directly benefit one or more TO zones for the purposes of maintaining reliability, typically for load growth. Baseline upgrades also include economic upgrades – transmission upgrades needed to mitigate unhedgeable congestion.

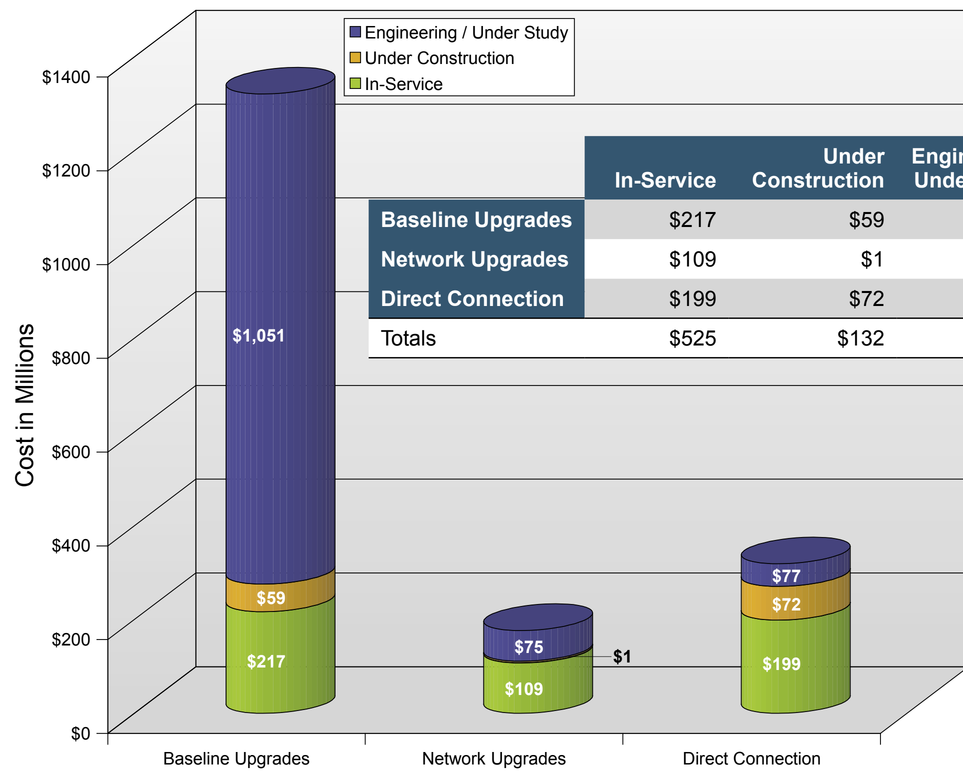
2. **Network** upgrades are those required to maintain reliability as the result of generation and merchant transmission interconnection requests and transmission service requests. Network upgrade costs are allocated based on a cost causation principle in proportion to contribution to the original system limitation.

3. **Direct Connection** facilities are those whose sole cost responsibility is that of the developer and only experience power flows to and from an interconnection project itself, (i.e., no parallel flows).

$ 1.8 Billion of Planned Transmission Investment

Through December 2005, over $1.8 billion of transmission expansions have been planned to meet the challenges of many system drivers: load growth, generation and merchant transmission interconnection requests, congestion, generator deactivations and operational performance. **Figure 1-1** captures the status of baseline, network and direct connection upgrades, through December 31, 2005.

Figure 1-1: Status of Baseline, Network and Direct Connection Upgrades



	In-Service	Under Construction	Engineering/ Under Study	Totals
Baseline Upgrades	$217	$59	$1,051	$1,327
Network Upgrades	$109	$1	$75	$185
Direct Connection	$199	$72	$77	$348
Totals	$525	$132	$1,203	$1,860

PJM's RTEP Attracts Generating Resource Investment

From a generating resource perspective – since the inception of PJM's open, non-discriminatory planning process in 1997 – more than 154,000 MW of new generation requests have been included in PJM's interconnection queues. To date, the system enhancements planned by PJM have accommodated more than 16,000 MW of new generation, representing more than 130 projects. These generation additions enhance system reliability, supply adequacy and competitive markets for PJM's market participants and the customers they serve. The generation additions represent various fuel types, including natural gas, wind and coal.

Transmission Owner Initiated (TOI) Upgrades

PJM's RTEP also includes TOI upgrades. PJM engineering staff work in concert with Transmission Organization (TO) staff to assess the impact of TOI upgrades on the PJM transmission system. Such upgrades, however, are the sole right of each individual TO to construct and are typically driven by local TO reliability requirements.

A Comprehensive Plan

PJM's comprehensive transmission expansion planning process examines the interrelated nature of load, generation and transmission within the PJM footprint, each part dependent on the others to function dependably and reliably much as would be the case for a single huge machine. PJM's planning process explores how various drivers impact each part of "the machine," employing various tools and methodologies to study and engineer recommended system upgrades so that PJM's members can meet load-serving obligations. This is described further in Section 2.

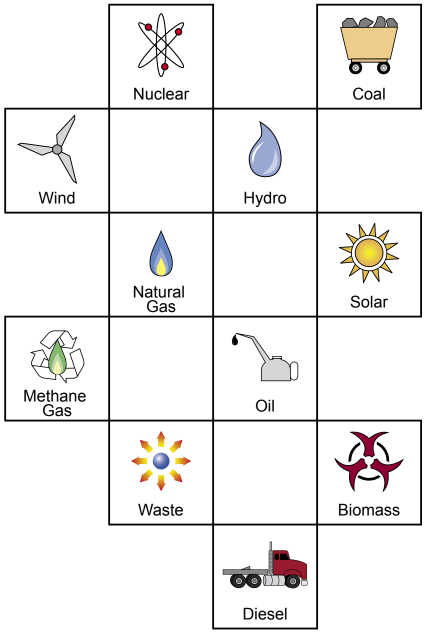


Table 1-1: PJM RTO Megawatt Summary – through close of Queue P, January 31, 2006

Active	Under Construction	In-Service	Withdrawn	Total Requests
24,989	3,565	16,562	114,121	159,237

Section 2: Developing an Expansion Plan

PJM DE DC IL IN KY MD MI NJ NC OH PA TN VA WV

Each RTEP encompasses the following: 1) a set of recommended "direct connection" transmission enhancements 2) a set of "network" transmission enhancements 3) a set of market-proposed generation or merchant transmission projects, 4) a set of baseline upgrades and 5) the cost responsibility of each party involved. These enhancements cover a range of possible power system element upgrades: circuit breaker replacements to accommodate increased current interrupting duty cycles, new capacitors to increase reactive power support, new lines, line reconductoring, new transformers to accommodate increased power flows and other circuit reconfigurations to accommodate power system changes.

The rules and procedures for the RTEP process are set forth in Schedule 6 of the PJM Operating Agreement. In accordance with those rules, PJM prepares a plan for the enhancement and expansion of transmission facilities to meet demands for firm transmission service and to support competition in the PJM region. PJM's planning process currently tests for reliability criteria violations in each of five successive years, and also assesses potential violations up to 10 years forward. RTEP plans include transmission upgrades needed to resolve reliability criteria violations in the five-year horizon. That five-year plan, with the baseline upgrades, establishes the baseline model used in subsequent interconnection studies for proposed generation, merchant transmission and long-term firm transmission service.

PJM's RTEP Process preserves the reliability of PJM's interstate transmission system to ensure that power continues to flow reliably to customers and that robust, competitive power markets continue to flourish. Fundamentally, no matter what the underlying driver of system expansion may be, the RTEP Process must ensure all system needs are met reliably. Understanding PJM's RTEP requires a fundamental understanding that system demand (load) forecasting, generation planning and transmission planning are inextricably linked. They are not mutually exclusive concepts. Rather, sound regional planning is predicated on analyses and processes which integrate all three to yield one holistic plan.

PLANNING TRENDS

PJM is presently in the process of developing and implementing RTEP Process changes necessary to incorporate a 15-year formal planning horizon.

2.1: Planning for Adequate Generation

For decades, PJM and its predecessor organizations set requirements for installed generating capacity to assure reliable service to loads. PJM and other system planners long have abided by well-established criteria to quantify adequate installed generation capacity, including the loss of load expectation (LOLE) criterion underlying PJM's current installed capacity requirement. The LOLE is a measure of the likelihood that system load (or demand) will exceed available generating capacity. In PJM and elsewhere, the LOLE requirement is set so that demand exceeds capacity on average no more than one day in 10 years on average. The installed capacity (ICAP) required to meet this criterion includes an Installed Reserve Margin (IRM), expressed as the percent reserve above the forecasted annual peak load net of Active Load Management (ALM). The first step in this process is the development of a load forecast.

2.1.1 – Load Forecasts

One of the core principles of PJM's planning process is the integration of all drivers that impact grid infrastructure planning needs and all solutions available to meet those needs. Load Forecasting is one such driver of resource adequacy requirements and transmission expansion plans.

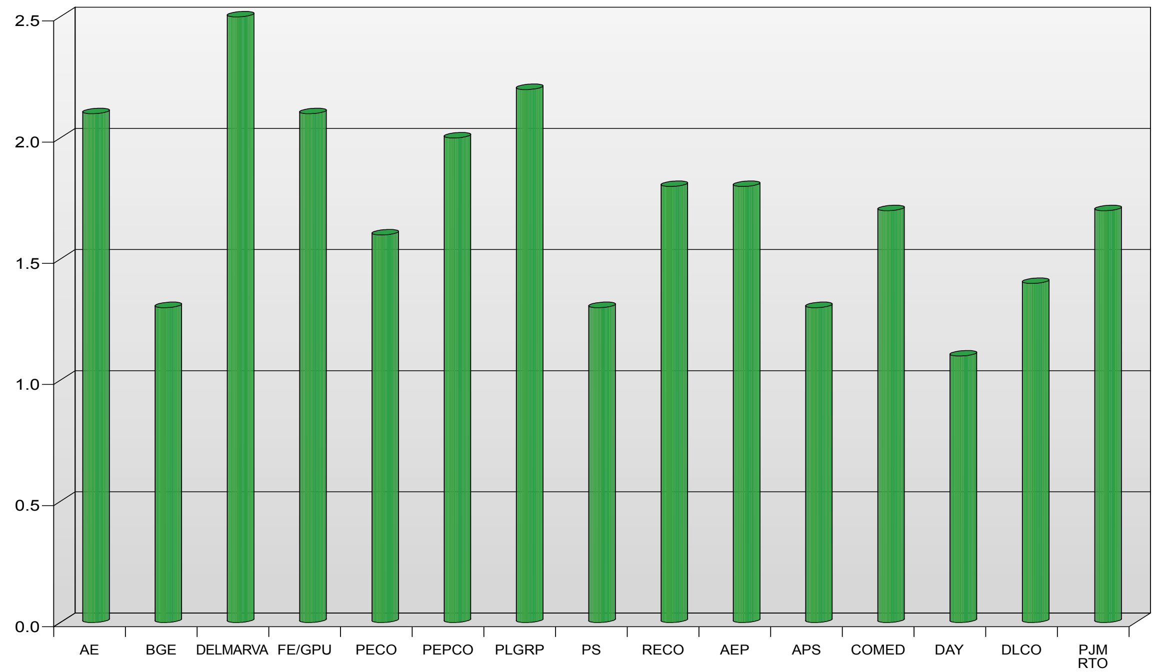
Resource Adequacy

Load forecasts are a fundamental component of PJM's capacity planning process. Specifically, load forecasts support the Reliability Study process that yields calculations for the Installed Reserve Margin (IRM) and the Active Load Management (ALM) Factor. In addition, entity forecasts are used for setting Load Serving Entity (LSE) capacity obligations, where LSEs must meet using deliverable capacity resources that are owned, contracted or obtained through PJM Capacity markets.

Transmission Planning

Load forecasts are also a key component of power flow modeling in transmission expansion studies, including those for emergency import capability studies associated with Capacity Emergency Transfer Objective / Capacity Emergency Transfer Limit (CETO/CETL) analysis. The concept of load deliverability as measured by the CETO/CETL test provides a means to ascribe capacity status to resources. Accurate zonal load forecasts are essential if transmission expansion studies are to yield plans that will continue to ensure reliable and economic system operations.

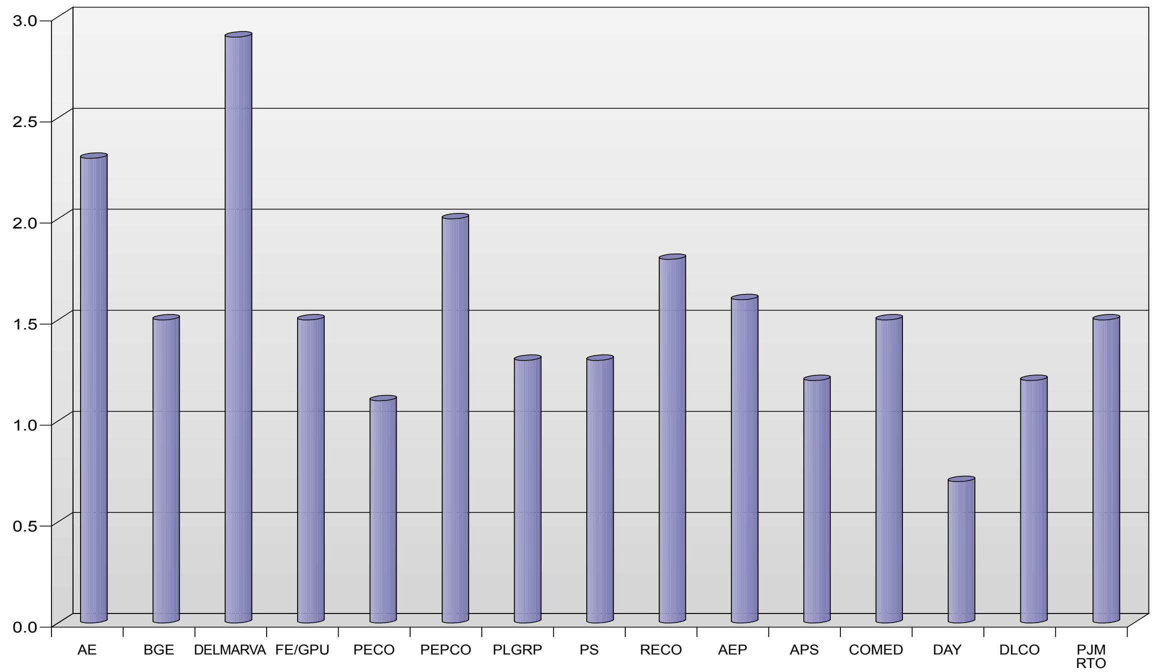
Figure 2.1.1-1: PJM Summer Peak Load Growth Rate



NOTE

The 2005 PJM Load Forecast Report was issued on February 11, 2005, prior to Dominion's integration into PJM. Thus, the actual and forecast load values shown above do not include the load served by Dominion in PJM during the 2005 summer period. The actual PJM 2005 summer peak load with Dominion included was about 135,000 MW and occurred on July 26, 2005. Full PJM load forecasts for the entire PJM footprint that includes Dominion will be provided with future updates to this report.

Figure 2.1.1-2: PJM Winter Peak Load Growth Rate



The PJM Load Forecast Model incorporates three classes of variables: 1) calendar effects such as day of the week, month, and holidays 2) a forecast of baseline economic conditions and 3) weather conditions across the RTO. Specifically, PJM is using Gross Metropolitan Product (GMP) in the econometric component of its forecast model, which allows for a localized treatment of economic effects within a zone. PJM has contracted with an outside economic services vendor to provide economic forecasts for all areas within the PJM footprint on an ongoing basis. To account for weather conditions across the RTO, PJM calculates a weighted average of the Temperature-Humidity Index (THI) by zone as the main weather driver. PJM has access to weather data from approximately 30 weather stations across the PJM footprint.

The PJM RTO weather normalized summer peak is forecasted to grow at an average rate of 1.7% annually over the next 10 years – from 115,166 MW in 2005 to 136,549 MW in 2015 – an increase of 21,383 MW over the decade. Individual geographic zone growth rates vary from 1.1% to 2.5%, as shown in **Figure 2.1.1-1**. The PJM RTO weather normalized winter peak is forecasted to grow at an average rate of 1.5% per year for the next ten years – from 95,679 MW in 2004/05 to 111,091 MW in 2014/15 – an increase of 15,412 MW over the decade. Individual geographic zone growth rates vary from 0.7% to 2.9%, as shown in **Figure 2.1.1-2**.

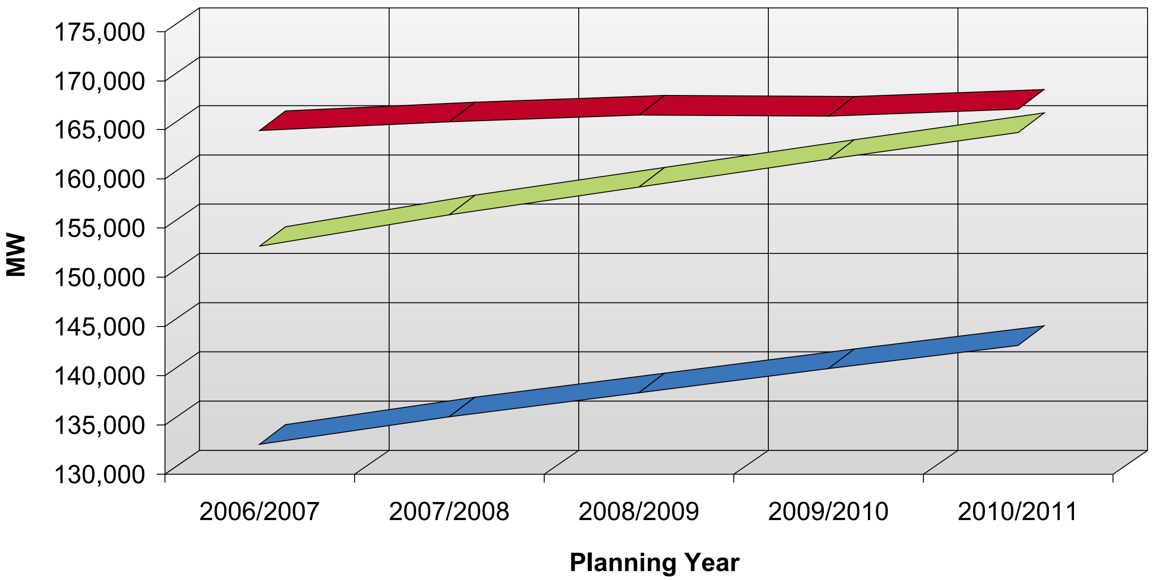
PLANNING TRENDS

Currently, an entity forecast is developed to set obligations for the upcoming Summer, per RAA changes made in 2002 to base obligations on forecasted load, not the weather-normalized peak load from the previous summer period. Migrating from a PJM diversified sum-of the-EDC forecasts approach to a more centralized PJM approach will yield more transparent, independently verifiable forecasts. This revised methodology provides an opportunity to develop zonal and even sub-zonal forecasts for use in refined reserve requirement studies and for use in transmission planning base cases that look at electrical areas smaller than a single Transmission Owner zone.

NOTE

GMP is a concept analogous to the commonly reported U.S. Gross Domestic Product. GMP measures the total annual value of goods and services at a Metropolitan level.

Figure 2.1.2-1: Forecasted PJM Reserve Margin



Monitoring current and expected system conditions to ensure adequate margins for reliability

Future Generating Capacity

The expected level of installed capacity as of the first day of the planning period.

Future generating capacity is calculated by adding the projected capacity additions from the PJM Regional Transmission Planning process to the current level of installed capacity within the PJM footprint. Generation that has formally announced retirement is removed.

Summer Peak Net Internal Demand + Installed Reserve Margin (IRM)

To account for weather uncertainty and generator outages that can arise during a summer, PJM calculates the "margin of safety" necessary in order to maintain the "1-in-10" reliability criterion.

For the 2005/2006 planning period, maintaining installed capacity reserves of 15% over projected Summer Peak Net Internal Demand fulfills the "1-in-10" standard.

Summer Peak Net Internal Demand

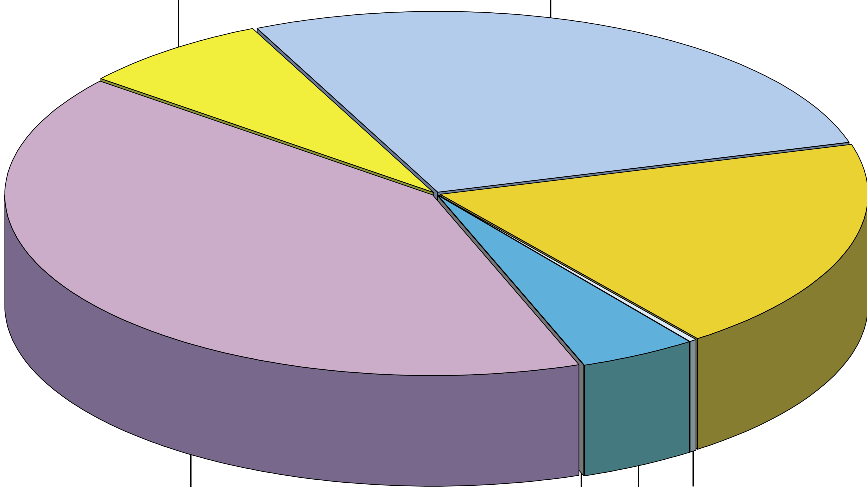
The expected summer Peak Net Internal Demand within the PJM footprint. This is calculated by removing load management from the PJM 50/50 peak load forecast.

This number is published annually by PJM in February in the PJM Load Forecast Report.

2.1.2 – Ensuring Adequate Reserve Margin

PJM uses probabilistic methods to determine the percent reserve margin that satisfies the established one-day-in-ten-years LOLE. The probabilistic analysis takes into account factors related to generation performance and load characteristics that affect reliability, such as generator forced outage rates and maintenance outage rates, load variability, load diversity, forecast uncertainty and the availability of emergency assistance from neighboring systems. The current IRM is 15% (i.e. 15% margin above the forecasted annual peak load net of ALM). **Figure 2.1.2-1** demonstrates that PJM's planned portfolio for installed generating capacity resources yields a forecasted Reserve Margin in excess of 15% through the 2010/2011 planning period.

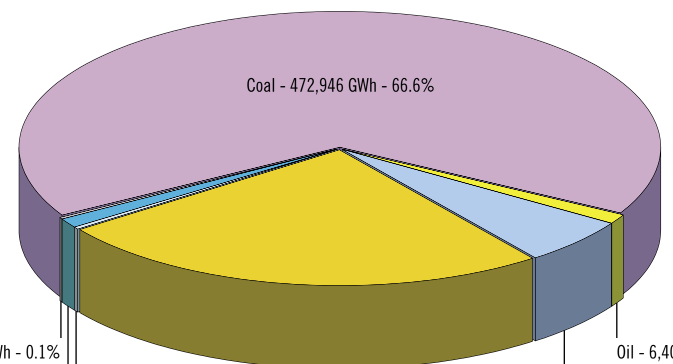
Figure 2.1.3-1: Fuel Mix of Existing PJM Installed Generating Capacity (12/31/05)



2.1.3 – PJM's Existing Generating Resource Portfolio

Each organization serving PJM load must own or acquire capacity resources to meet its respective capacity obligations. Load-serving entities (LSEs) can acquire capacity resources by entering into bilateral agreements, by participating in the PJM-operated Capacity Credit Market or by owning generation. Collectively, all arrangements by which LSEs acquire capacity are known as the Capacity Market. Presently, PJM existing generating resource portfolio includes more than 164,000 MW of installed capacity across 1082 generating sources, representing some half-dozen plus fuel types, as shown in **Figure 2.1.3-1**. For perspective, actual energy output by fuel type for generation in PJM during 2005 is shown in **Figure 2.1.3-2**.

Figure 2.1.3-2: PJM Generation Energy Output by Fuel Type (2005)



2.2: Generator Interconnection Requests

Requests for interconnection of new generating resources, while not the sole drivers of the RTEP Process, are a key component of the RTEP plan. Analyzing these requests has required adoption of an approach that establishes baseline system improvements driven by known inputs, followed by separate queue-defined, cluster-based impact study analyses. **Table 2.2-1** contains the status of generator interconnection requests in each PJM queue. Section 3.6 of this report discusses generation interconnection activity across the PJM footprint in more detail.

Any entity that requests interconnection of a generating facility (including increases to the capacity of an existing generating unit) or requests interconnection of a merchant transmission facility within the PJM RTO must do so within PJM's defined interconnection process. Overall, PJM's RTEP Process – under a FERC-approved RTO model – encompasses independent analysis, recommendation and approval to ensure that facility enhancements and cost responsibilities can be identified in a fair and non-discriminatory manner, free of any market sector's influence. All PJM market participants can be assured that the proposed regional plan has been created on a level playing field.

Since the inception of PJM's open, non-discriminatory planning process in 1997, more than 154,000 MW of new generation requests have been processed through PJM's interconnection request queues. To date, the system enhancements planned by PJM have accommodated more than 16,000 MW of new generation, representing more than 130 projects. These generation additions enhance system reliability, supply adequacy and competitive markets for PJM's market participants and the customers they serve. Importantly, the generation additions represent various fuel types, including natural gas, wind and coal. While early requests for generator interconnections were primarily for natural gas-fired units, recent trends favor wind, clean-coal and methane gas resources as well.

2.2.1 – Behind the Meter Generator Interconnection Requests

Behind The Meter Generation (BTM) refers to one or more generating units that are located with load at a single location such that no transmission or distribution facilities owned or operated by any transmission owner or electric distributor are used to deliver energy from the generating unit(s) to load. BTM excludes: 1) at any time, any portion of such generating unit(s)' capacity that is designated

Table 2.2-1: Summary of Generator Interconnection Request Queue Activity

Queue	Window	Active		Under Construction		In-Service*		Withdrawn		Total Requests	
	(close date)	MW	# of Projects	MW	# of Projects	MW	# of Projects	MW	# of Projects	MW	# of Projects
A	4/15/1999	0	0	1,259	1	7,653	27	18,145	34	27,057	62
B	11/30/1999	0	0	7	0	4,531	20	15,882	41	20,420	61
C	3/31/2000	47	1	436	1	27	2	4,104	20	4,614	24
D	7/31/2000	0	0	0	0	716	13	7,603	22	8,319	35
E	11/30/2000	0	0	0	0	795	8	17,637	38	18,432	46
F	1/31/2001	0	0	0	0	52	3	3,093	7	3,145	10
G	7/31/2001	1,270	3	674	1	337	19	21,293	53	23,574	76
H	1/31/2002	0	0	540	3	163	9	8,422	24	9,125	36
I	7/31/2002	105	3	8	1	37	4	4,863	16	5,013	24
J	1/31/2003	200	1	22	1	14	2	707	7	943	11
K	7/31/2003	55	3	473	6	219	10	2,068	14	2,815	33
L	1/31/2004	840	6	27	2	40	5	3,383	15	4,290	28
M	7/31/2004	1,465	8	112	2	88	4	2,930	11	4,595	25
N	1/31/2005	4,675	28	4	1	1,809	7	3,269	16	9,757	52
O	7/31/2005	7,164	56	3	1	81	4	662	3	7,910	64
P	1/31/2006	9,168	54	0	0	0	0	60	3	9,228	25
TOTAL		24,989	163	3,565	20	16,562	137	114,121	324	159,237	612

* Total MW requested is not the sum of the four columns preceding it as it reflects the actual total MW requested and does not change once a queue closes. In-service MW does and can change to account for units that are phased into commercial operation. Data Valid as of 1/31/2006, the close of Queue 'P'..

as a capacity resource or 2) in any hour, any portion of the output of the generating unit(s) that is sold to another entity for consumption at another electrical location or into the PJM Interchange Energy Market. BTM rules permit LSEs in PJM to net operating BTM against load in the calculation of charges for energy, capacity, transmission service, ancillary services and PJM administrative fees. This approach is intended to encourage the use of BTM during times of scarcity and high prices, thus increasing the opportunity for load to compete in PJM markets. Any BTM that desires to be designated, in whole or in part, as a Capacity Resource or Energy Resource must submit a Generation Interconnection Request.

2.3: Generator Deactivations

Several factors affect a system's ability to meet reliability criteria. These factors include load growth, generation additions and generation retirements. The large number of generation retirements announced in the last two years have caused multiple reliability criteria violations, particularly when coupled with steady load growth, and sluggish generation additions, often in locations which do not offer the greatest beneficial impact.

Some potential reliability issues have been forestalled though a combination of short lead-time transmission upgrades, voluntary deactivation deferrals and implementation of a process that offers compensation to generators that remain on-line beyond announced retirement dates. However, on this last point, the FERC has ruled that PJM can not require generators to remain in service. From an RTEP perspective, a number of baseline reliability transmission upgrades must be completed to ensure PJM's ability to meet established reliability standards.

If present trends continue, reliability criteria violations will likely appear in other areas of PJM where similar conditions exist. **Table 2.3.1-1** provides a summary of actual retirements, deferrals and those pending, by TO zone. Section 3.1 addresses specific impacts on Eastern PJM.

PLANNING TRENDS

The Federal Energy Regulatory Commission recently determined that PJM cannot compel the owners of units proposed for retirement to remain in service; and that such retirements may take effect upon 90 days prior notice. This time period is designed to allow PJM to assess the reliability effects of proposed retirements, and to make compensation arrangements with the owner to retain in service units needed for reliability.

Table 2.3.1-1: Summary of Generator Deactivations in PJM

TO Zone	Retirements (MW)	Pending Retirements (MW)	Deferrals (MW)	Totals (MW)
AE	74	447	0	521
AEP	230	0	0	230
ComEd	3466	0	0	3466
BGE	101	0	0	101
DELMARVA	10	0	0	10
DQE	244	0	0	244
JCPL	265	0	90	355
METED	20	0	0	20
PECO	250	0	0	250
PEPCO	0	2	0	2
PPL	0	285	0	285
PENELEC	309	0	39	348
PSEG	788	836	0	1624
TOTALS	5757	1570	129	7456

2.4: Merchant Transmission Activity

Once thought to offer a long-term solution to long distance transmission needs, few merchant transmission proposals have emerged. Financing has proven difficult for projects given uncertain revenue streams in part the result of insufficient subscription up front. Further, the difficulties, risks and realities associated with securing rights-of-way and environmental clearances have also had a dampening effect on the emergence of long distance proposals. Merchant transmission interconnection activity is discussed in more detail in Section 3.7 of this report.

2.5: Assessing Baseline Load Deliverability

In developing the RTEP, PJM tests the baseline adequacy of the transmission system to deliver energy and capacity resources to loads in all areas of the PJM region. For this purpose, PJM tests generator and load deliverability for each relevant electric area within PJM. Essentially, load deliverability refers to the transmission system's capability to deliver energy from the aggregate of all capacity resources to an electrical area experiencing a capacity deficiency to meet a defined one-day-in-25-years probability of load exceeding available generating capacity. (Additional information explaining PJM's deliverability testing methodology can be found in PJM's M14B Manual, at www.pjm.com.)

The relevant electric areas tested in this fashion are determined functionally, based on the topology of the electric system and the location of transmission constraints. The areas addressed may include transmission-owner zones, aggregates of such zones, or sub-zones within such zones, i.e., wherever there are constraints that are likely to limit emergency transfers into an area of load.

In the event that reliability criteria violations are identified (e.g., a failure to satisfy the load deliverability test), PJM explores and identifies various solutions to mitigate reliability criteria violations. These include transmission upgrades, proposed generation additions, load response mechanisms or some combination of these. The RTEP takes into account any previously proposed generation projects, capacity imports, or load response solutions, but the RTEP Process does not order or solicit any generation projects or load response solutions, or set price signals to guide developers of such projects.

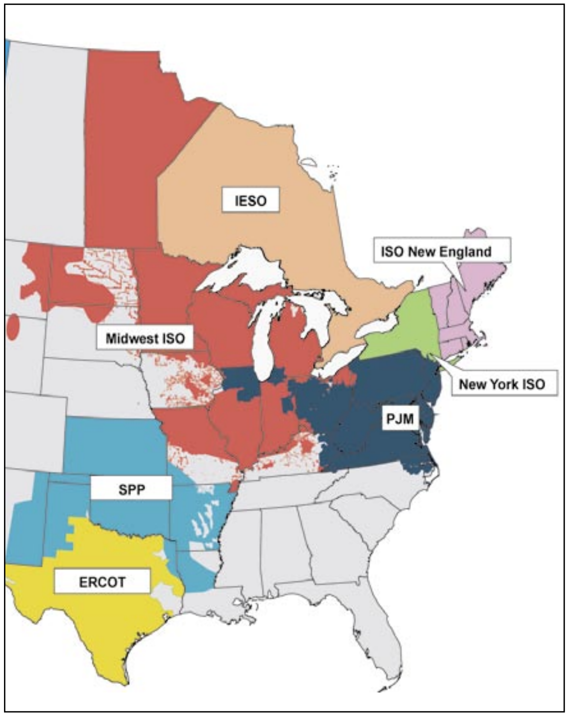
2.6: Economic Planning – Mitigating Congestion

In 2004, the Federal Energy Regulatory Commission approved changes to the RTEP Process that allow PJM, in certain narrowly defined circumstances, to order transmission upgrades needed to enhance competition, in addition to those needed to resolve reliability criteria violations. Under these recently implemented rules, PJM relies on its ongoing assessments of transmission congestion to identify transmission upgrades needed to address congestion that is deemed to be “unhedgeable.” Rather than immediately ordering such upgrades, however, the economic planning process incorporates a “market window,” i.e., a period of time for competition among alternative solutions to come forward voluntarily and resolve the congestion issue. Only if market forces do not resolve such congestion within the window will PJM order construction of transmission upgrades.

Activity since 2004 has witnessed the completion of 39 one-year open market windows. Of the 39 market windows that have closed, 28 (72%) have RTEP reliability based or transmission owner Identified projects that are expected to mitigate or completely remove the congestion.

2.7: Planning at PJM RTO Boundaries and with Adjoining Systems

Expanding inter-regional markets and system inter-operability require that PJM coordinate integrated system assessments and planning at RTO/ISO transmission interfaces. Missed opportunities to resolve reliability criteria compliance issues could arise, absent inter-regional mechanisms to address such issues jointly and proactively. Coupled with FERC-defined policies that require RTOs to develop mechanisms to address inter-regional coordination, PJM has initiated efforts to implement coordination processes with adjoining systems west, northeast and south of PJM as part of its ongoing, evolving single-entity RTEP Process.



2.7.1 – PJM / Midwest ISO

Following FERC's RTO directives to develop mechanisms to address inter-regional coordination, PJM and the Midwest ISO executed a Joint Operating Agreement (JOA) in March, 2004 in pursuit of establishing a broader market. Overall, the JOA establishes the terms and conditions under which PJM and Midwest ISO coordinate the exchange of data and information and conduct coordinated regional transmission expansion planning.

2.7.2 – PJM / NYISIO / ISO-NE

PJM, ISO-NE and NYISO finalized the "Northeastern ISO/RTO Planning Coordination Protocol" in December, 2004. The protocol establishes procedures for data and information exchange, coordination of interconnection requests expected to have cross-border impacts, analysis of firm transmission service requests likely to have cross-border impacts and development of a Northeast Coordinated System Plan.

2.7.3 – PJM / TVA and Other Arrangements

Given PJM's recent market integration activities, PJM's footprint will adjoins additional systems to the south of Dominion and AEP, including the Tennessee Valley Authority (TVA). PJM is presently in discussions with TVA to explore joint efforts to pursue interregional assessments and interregional plan development. To date, TVA has expressed interest in data sharing and planning assessments. PJM will pursue data sharing and planning assessments with TVA with the goal of establishing a JOA similar to that of the PJM/ Midwest ISO JOA, tailored to address TVA's specific jurisdictional and organizational issues. In addition to TVA, PJM will also explore JOA arrangements with other systems adjoining PJM to the south of AEP and Dominion.

2.7.4 – Current Activities

PJM is presently engaged in a number of planning activities associated with each of these interregional coordination arrangements. **Section 3.9** of this report discusses each in more detail.

Section 3: Discussion Areas - Explaining PJM's Expansion Plan

PJM	DE	DC	IL	IN	KY	MD	MI	NJ	NC	OH	PA	TN	VA	WV

Regional Transmission Expansion Planning on the scale of PJM's footprint (See **Map 3.1**) requires the flexibility to discuss system planning challenges from various perspectives. To date, PJM's RTEP has employed both geographical and topical approaches to describe the "what, why and where" of needed transmission upgrades.

1. **Geographical Discussion Areas.** Upgrades in a very specific, localized geographical area may be driven by a number of factors over time. Describing such upgrades in terms of geography or power system topology in such cases makes sense especially if a number of drivers are in play.

2. **Topical Discussion Areas.** A specific subject matter area may be the focus of a number of upgrades across a broad part of PJM's footprint. For example, such discussion areas might address the individual impact of generator deactivations, interconnection requests or new technologies (as with wind-powered generating resources).

In this report, PJM uses the above-mentioned "Discussion Area" approaches as a mechanism for describing and explaining specific groups of upgrades more easily. To that end, this report explores and explains PJM's expansion plans according to the following Discussion Areas in this Section 3:

Section 3.1: Eastern PJM Reliability Studies

Section 3.2: Southwestern PJM Reliability Studies

Section 3.3: PJM West-to-East Transfers

Section 3.4: Delmarva Peninsula

Section 3.5: Generation Interconnection Activities

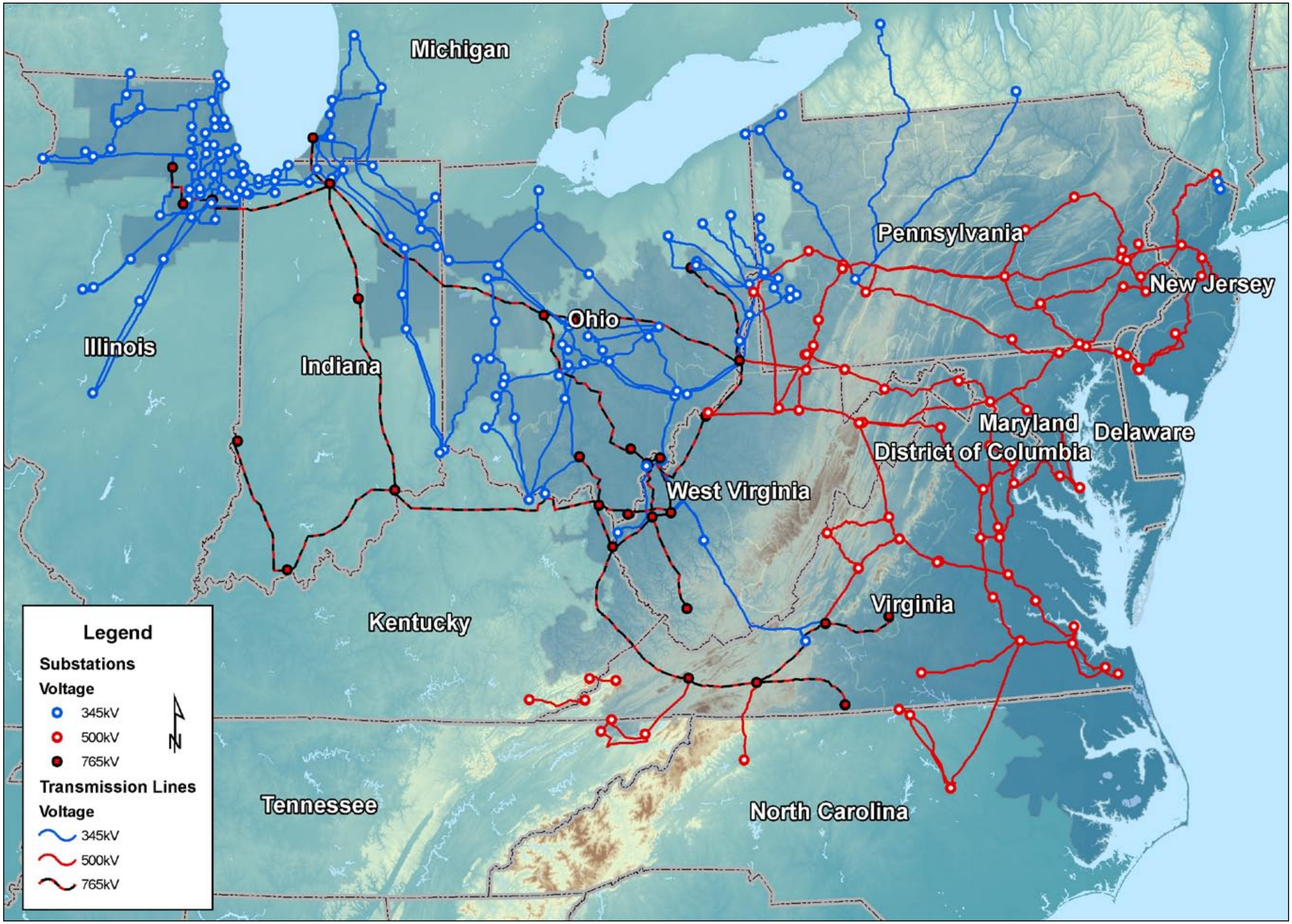
Section 3.6: Wind Generation Activities

Section 3.7: Merchant Transmission Interconnection Activities

Section 3.8: Transmission Owner Improvements (TOIs)

Section 3.9: Interregional Planning Activities

Map 3-1: PJM Backbone Transmission System



Section 3.1: Eastern PJM Reliability Studies

3.1.1 – Reliability Issues in Eastern PJM

In essence, the system reliability trends that have emerged in eastern PJM over the past seven years constitute a classic study of planning for a system that faces growing customer demand, sluggish generating resource additions and reliance on transmission system facilities to bridge the two. The Eastern Mid-Atlantic area of PJM (Eastern PJM) is served by the following Transmission Owners: AE, Delmarva, JCP&L (FE/GPU), PECO, PSE&G and Rockland Electric Company, as shown in **Map 3.1.1-1**. Baseline reliability analyses since 1999 have revealed the need to address the ability of the generation and transmission resources in Eastern PJM to continue to serve load reliably.

Map 3.1.1-1: Eastern PJM 500 kV Transmission System

A key finding of the 1999 PJM RTEP Baseline analysis revealed that by 2006, Eastern PJM would begin to experience reliability issues absent the addition of generation resources or transmission enhancements to meet growing consumer demand. Those reliability concerns were largely mitigated between 1999 and 2003 with the addition of new generating resources. More recently however, continued load growth, retirement of existing generation resources, sluggish development of new generating resources and continued reliance on transmission to meet load deliverability requirements and provide access to cheaper sources of power west of this area, are collectively making additional negative inroads on sustained system reliability in Eastern PJM.

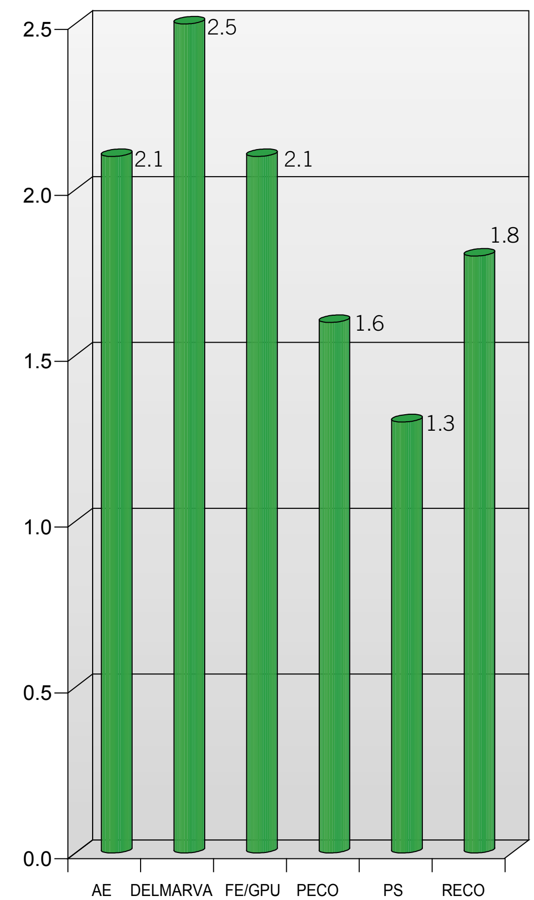
In addition, the extent to which Eastern PJM continues to rely on transfers into the area to meet load-serving needs also has a definable, negative impact on the high voltage backbone transmission system in other parts of PJM, notably that area of PJM's transmission system west and northwest of the Baltimore and Washington metropolitan areas, as discussed in more detail in Section 3.3 in this report.

3.1.2 – Load Trends

One of the core principles of PJM's planning process is the integration of all drivers that impact grid infrastructure planning needs and all solutions available to meet those needs. Increasing forecasted load levels are a key, primary driver of generating resource requirements and transmission expansion plans. **Figure 3.1.2-1** shows the forecasted 10-year load growth rates for AE, Delmarva, JCP&L (FE/GPU), PECO, PSE&G and Rockland Electric.

The weather normalized summer peak in Eastern PJM is forecasted to grow at an average rate of 1.8% annually over the next ten years – from 32,301 MW in 2005 to 38,574 MW in 2015 – an increase of 6,273 MW over the intervening decade. Individual geographic zone growth rates vary from 1.3% to 2.5%, as shown in Figure 3.1.2-1. From an RTEP perspective, a number of baseline reliability transmission upgrades will be completed to assure PJM's ability to meet established reliability standards.

Figure 3.1.2-1: PJM Summer Peak Load Growth Rate



3.1.3 – Impact of Merchant Transmission interconnection Requests

Presently, four merchant transmission interconnection requests are queued in PJM whose development includes New Jersey as a terminus within PJM, as enumerated in **Table 3.1.3-1** and shown on **Map 3.1.3-1**.

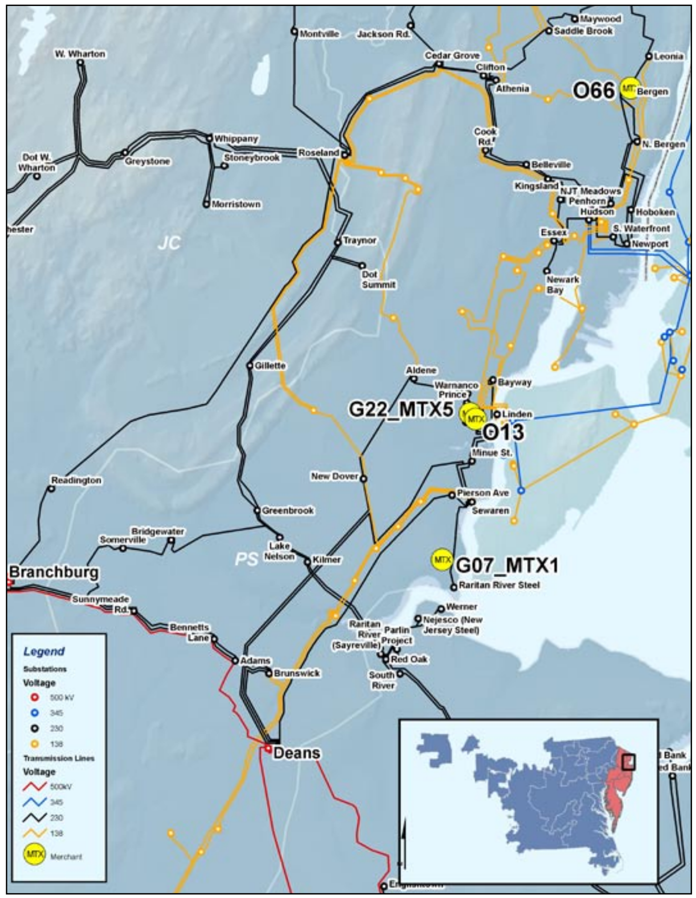
PJM's RTEP, representing plans completed and approved by the PJM Board through December 2005 presently only encompasses the upgrades required to accommodate merchant transmission interconnection requests in Queues A through N. The merchant transmission interconnection requests in Queue O and P are presently in initial study phases of PJM's interconnection process out of which the recommended transmission upgrades will be included in a near-future RTEP update. (Additional information on the impact of merchant transmission interconnection requests, in Queues A through N, throughout PJM can be found in Section 3.7.)

As for the two merchant transmission interconnection requests in Queue G with terminals in New Jersey, the requested withdrawal rights associated with these two projects permit PJM market participants to export capacity and energy to New York and systems beyond from generation resources based in PJM, to its west and to its south. The 2009 anticipated system conditions studied have revealed the need for significant upgrades to accommodate these facilities based on the implicit need to have sufficient transmission in place to 'deliver' up to 1090 MW (collectively) to the New Jersey terminals of these facilities. In essence, operated in this mode, the facilities appear to PJM as a net increase in load in New Jersey. The transmission enhancements required for these facilities are discussed in more detail in **Section 3.7**.

Table 3.1.3-1: Merchant Transmission Interconnection Request Queue Activity Within Eastern PJM

Queue	Project Name	MW	Type	Status	Schedule	TO
G07_MTX1	Sayreville 230 kV	790	DC	UC	6/30/07	JCPL
G22_MTX5	Linden 230 kV	300	VFT	UC	4/4/07	PSEG
J02_MTX13	Keeney XFMR 230/138 kV		AC	IS	5/31/03	DPL
J07_MTX12	Cheswold XFMR 138/69 kV		AC	IS	12/31/03	DPL
O13	Linden - Harbor Cable II	520	DC	ACTIVE	2/1/08	PSEG
O16	Chichester-Linwood 230 kV		AC	IS	6/19/05	PECO
O66	Bergen 230 kV	670	DC	ACTIVE	7/1/09	PSEG

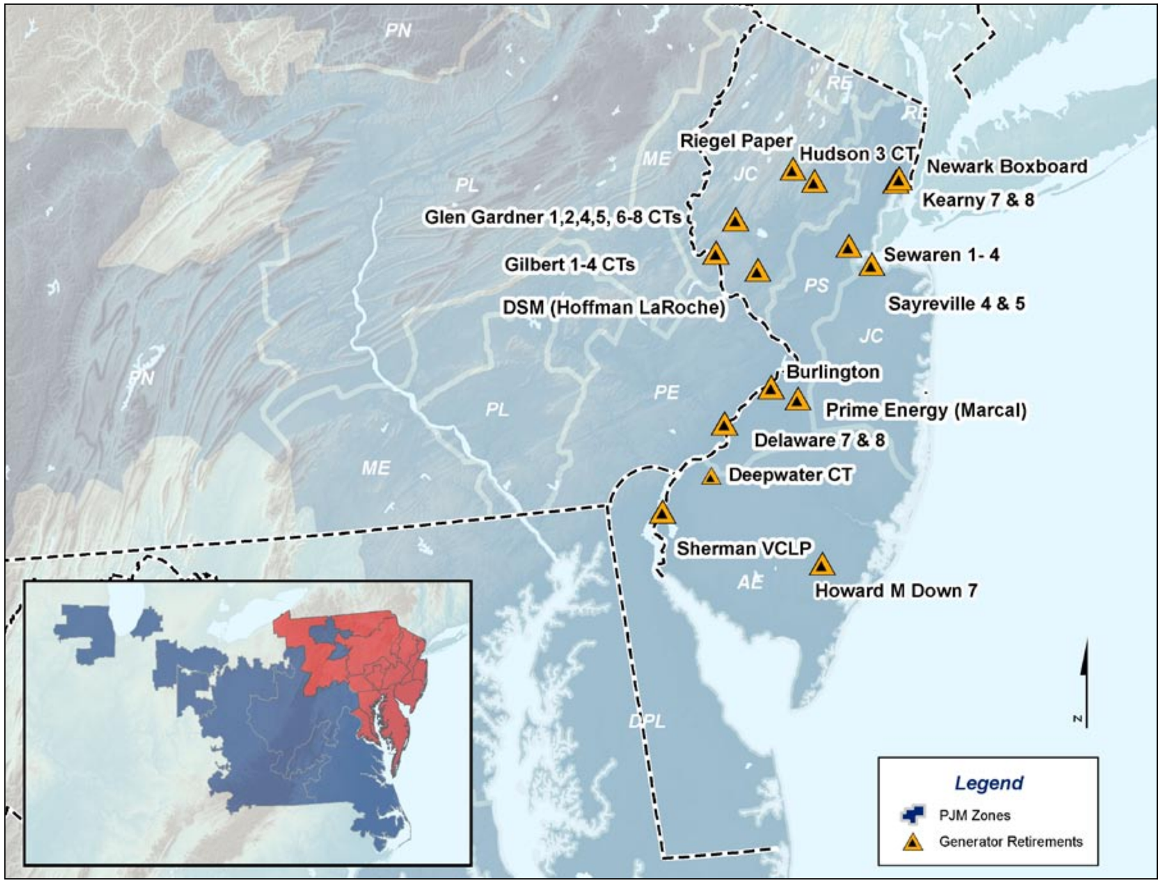
Map 3.1.3-1: Location of Queued Merchant Transmission Interconnection Projects within Eastern PJM



3.1.4 – Generation Deactivations Impact Eastern PJM Reliability

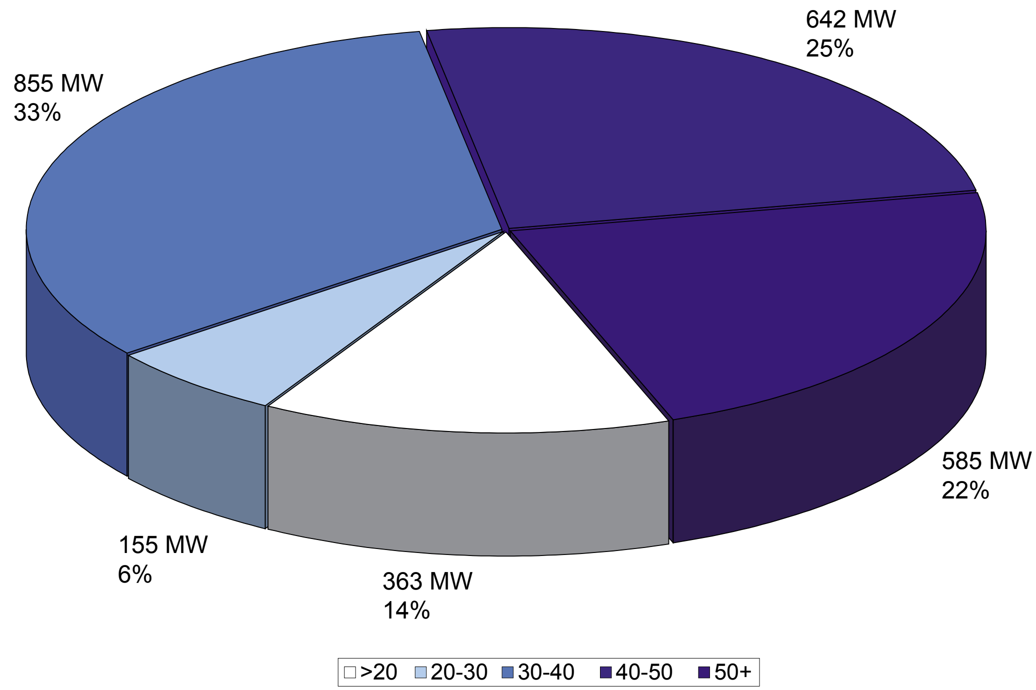
Successive baseline studies since 2003 have identified reliability issues over the next seven years associated with the retirement of generation over the same period. Overall, those studies reveal that between 2003 and 2009, over 2,700 MW of generation is expected to retire, as summarized in **Table 3.1.4-1** and shown in **Map 3.1.4-1**. Presently, over 45% of the MW generation in Eastern PJM is from plants in excess of 40 years of age, as shown in **Figure 3.1.4-1**. These retirements, coupled with load growth of 1.8% and sluggish generation development where needed, are having definable negative impacts on load-serving generation reserve levels and transmission system reliability.

Map 3.1.4-1: Location of Anticipated Generator Retirements in Eastern PJM



Some potential reliability issues have been forestalled though a combination of short lead-time transmission upgrades, voluntary deactivation deferrals and implementation of a process that offers compensation to generators that remain online beyond announced retirement dates. However, on this last point, the FERC has ruled that PJM can not <u>require</u> generators to remain in service. From an RTEP perspective, a number of baseline reliability transmission upgrades must be completed to ensure PJM's ability to meet established reliability standards.

Figure 3.1.4-1: Generation Deactivations in Eastern PJM, by Age



NOTE

PJM uses the term generation *deactivation* to refer to the retirement or mothballing of a generating unit governed by Part V of the PJM Open Access Transmission Tariff.

3.1.5 – Generation Interconnection Requests

Specific state by state listings of queued generation interconnection requests by TO zone may be found in **Section 4** of this report.

These additions to some extent would offset anticipated generating plant retirements through 2008, though not all and not all in optimum locations to mitigate known transmission reliability constraints and to meet forecasted load growth.

3.1.6 – Transmission Expansion Requirements

Taken the aforementioned system drivers into account, a number of baseline transmission expansion upgrades are required to address local transmission issues and broader load deliverability issues. Upgrades with costs of $2 million or more are enumerated in **Table 3.1.6-1** and shown in **Map 3.1.6-1**. These upgrades, and many more, are required to meet established PJM reliability criteria. **Figure 3.1.6-1** shows the increasing, cumulative cost of baseline upgrades in Eastern PJM through 2009 and beyond.

The extent to which Eastern PJM continues to rely on transfers into the area to meet load-serving needs also has a definable negative impact on the transfer capability of the high voltage backbone transmission system into the PJM's transmission system west and northwest of the Baltimore and Washington D.C. areas, as discussed in more detail in Section 3.3.

Table 3.1.4-1: Anticipated Generation Retirements in Eastern PJM

Retirement Date	Generator	TO	Capacity (MW)
Oct-03	Hudson 3CT	PSEG	129
Feb-04	Sayreville 4, 5	JCPL	229
Mar-04	Delaware 7, 8	PECO	250
Apr-04	Burlington 101 - 105	PSEG	260
Jun-04	Sherman VCLP	AE	47
Jan-05	Riegel Paper	JCPL	27
May-05	Deepwater CT A	AE	19
Jun-05	Kearny 7, 8	PSEG	300
Jun-05	Howard M Down 7	AE	8
Oct-05	DSM (Hoffman LaRoche)	JCPL	9
Oct-05	Newark Boxboard	PSEG	52
Jan-06	Prime Energy (Marcal)	PSEG	47
2006	Glen Gardner 1 & 5	JCPL	40
2006	Gilbert 1 & 4	JCPL	50
2007	BL England 1–3, IC1-IC4	AE	447
2008	Hudson 1	PSEG	383
2008	Sewaren 1-4	PSEG	455
TOTAL			2,752

Map 3.1.6-1: Transmission Expansion Upgrades in Eastern PJM

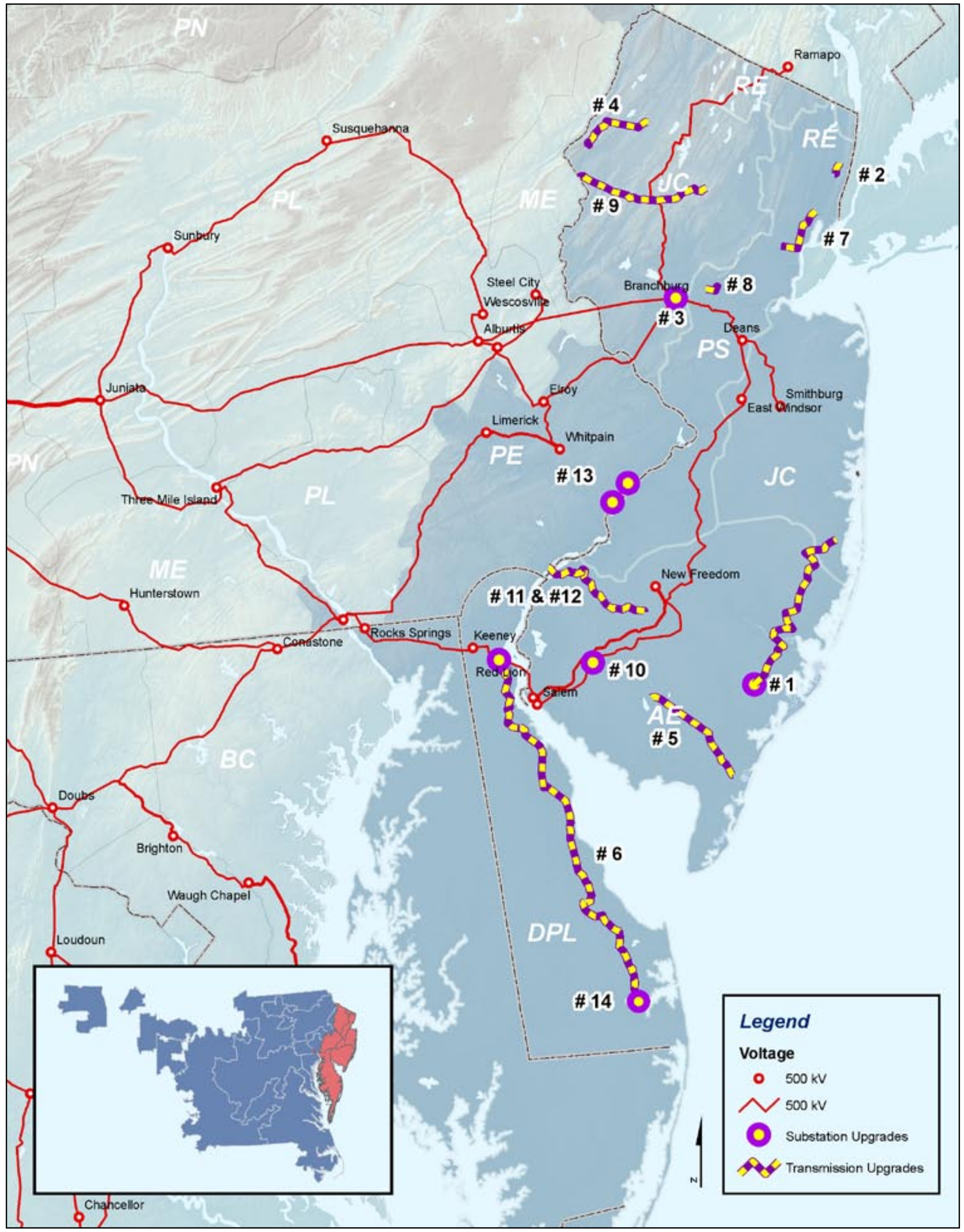


Figure 3.1.6-1: Cumulative Cost of Baseline Upgrades in Eastern PJM

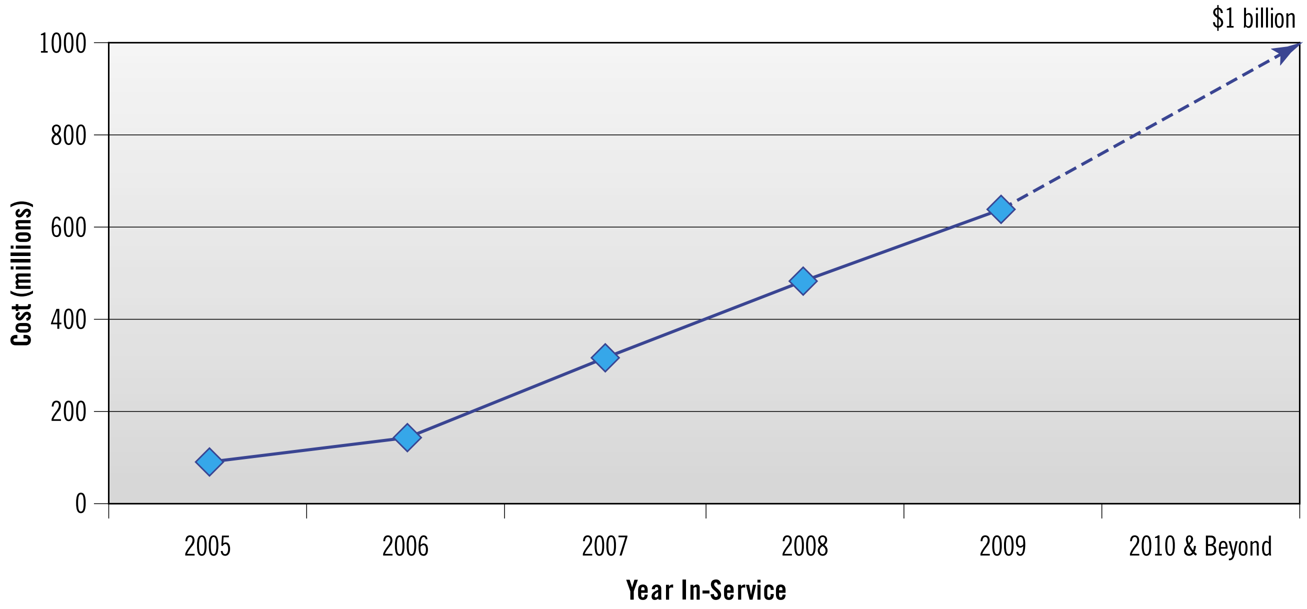


Table 3.1.6-1: Eastern PJM Upgrades

		System Upgrade Drivers											
		Baseline Upgrades				Network Upgrades		TOI Upgrade	Transmission Service				
Map Ref.	**Constraint** / Upgrade Description	Baseline Load Growth/ Deliverability & Reliability	Congestion Relief – Economic	Operational Performance	Generator Deactivation	Generation Interconnection	Merchant Transmission Interconnection	TO – Local Issue	Long-term Firm Transmission Service	Date / Status	Cost	TO Zones	States
1	**Imports into AE Coastal Area**											AE	NJ
	Construct four breaker ring bus and install Dynamic reactive device at Cardiff	X								April 2003	$ 13.9 M	AE	NJ
	Construct new 230 kV circuit between Cardiff and Oyster Creek	X								June 2005	$ 58 M	AE	NJ
2	**Bergen-Leonia 230 kV**											PSEG	NJ
	Convert the Bergen-Leonia 138 kV circuit to 230 kV Circuit.	X								May 2008	$ 20 M	PSEG	NJ
3	**Branchburg 500/230 kV Transformer**											PSEG	NJ
	Install third Branchburg 500/230 kV transformer	X								April 2005	$ 15 M	PSEG	NJ
	Replace all de-rated Branchburg 500/230 kV transformers	X								January 2007	$ 20 M	PSEG	NJ
4	**Kittatinny – Newton 230 kV**											PSEG	NJ
	Reconductor Kittatinny – Newton 230 kV with 1590 ACSS	X								June 2007	$ 20 M	PSEG	NJ
5	**Imports into AE Coastal Area**											AE	NJ
	Build new Cumberland – Dennis 230 kV circuit which replaces existing Cumberland – Corson 138 kV	X								December 2007	$ 17.05 M	AE	NJ
	Install Dennis 230/138 kV, Dennis 150 MVAR Dynamic reactive device and 50 MVAR capacitor	X								December 2007	$ 27.4 M	AE	NJ
6	**Imports to Delmarva Peninsula**											DPL	NJ
	Build new Red Lion – Milford – Indian River 230 kV circuit	X								June 2006	$ 44.9 M	DPL	NJ
7	**Imports to Northern PSE&G**											PSEG	NJ
	Build new Essex – Aldene 230 kV cable connected through a phase angle regulator at Essex	X								May 2007	$ 40 M	PSEG	NJ

Table 3.1.6-1: Eastern PJM Upgrades, Continued

		System Upgrade Drivers											
		Baseline Upgrades				**Network Upgrades**		**TOI Upgrade**	**Transmission Service**				
Map Ref.	**Constraint** / Upgrade Description	Baseline Load Growth/ Deliverability & Reliability	Congestion Relief – Economic	Operational Performance	Generator Deactivation	Generation Interconnection	Merchant Transmission Interconnection	TO – Local Issue	Long-term Firm Transmission Service	Date / Status	Cost	TO Zones	States
8	**Flagtown-Somerville-Bridgewater 230 kV Circuit**											PSEG	NJ
	Reconductor the Flagtown-Somerville-Bridgewater 230 kV circuit with 1590 ACSS	X								June 2008	$ 12 M	PSEG	NJ
9	**Portland – Greystone 230 kV Circuit**											JCPL	NJ
	Upgrade the Portland – Greystone 230 kV circuit	X								June 2008	$ 20 M	JCPL	NJ
10	**Chichester - Mickleton 230 kV Circuit**											AE	NJ
	Install a new 500/230 kV substation in AE area, the high side will be tapped on the Salem - East Windsor 500 kV circuit and the low side will be tapped on the Churchtown - Cumberland 230 kV circuit.	X								May 2008	$ 52.09 M	AE	NJ
11	**Imports into E. Mid-Atlantic Area**											AE	NJ
	Mickleton - Trainer 230 kV reconductor	X								May 2009	$ 14 M	AE	NJ
12	**Interconnection Request**											PSEG	NJ
	Add 2nd Mickleton - Monroe 230 kV circuit					X				June 2003	$ 11.48 M	AE	NJ
13	**Interconnection Request**											PECO	PA
	Replace 230/138 kV transformer at Holmsberg; Richmond - Holmsberg Tp conversion project; and add Rich					X				June 2004	$ 17.1 M	PECO	PA
14	**(TO Upgrade)**											DPL	DE
	Installed Indian River dynamic reactive device @ 230 kV							X		June 20004	$ 12.32 M	DPL	DE
15	**(TO Upgrade)**											PSEG	NJ
	Replace thirteen transmission class transformers and associated equipment							X		June 2006	$ 18.8 M	PSEG	NJ

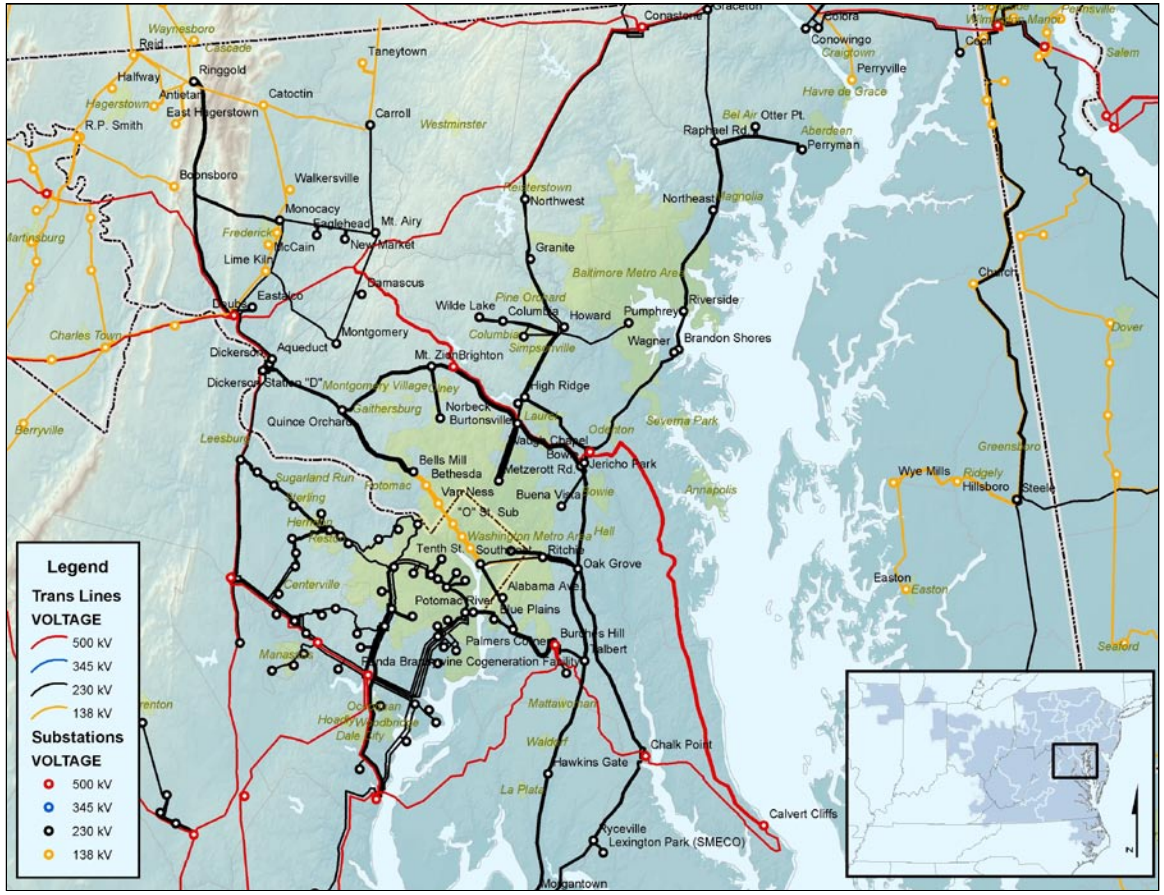
Section 3.2: Southwestern PJM Reliability Studies

3.2.1 – Reliability Issues in Southwestern PJM

In essence, the system reliability trends that have emerged in Eastern PJM over the past seven years have emerged in Southwestern PJM as well. The electric power system in the greater Baltimore / Washington D.C. Metropolitan area also faces growing customer demand, sluggish generating resource additions and reliance on transmission system facilities to bridge the two. This area of PJM is served by Transmission Owners BGE and Pepco, as shown in **Map 3.2.1-1**. Baseline reliability analyses since 1999 have revealed the need to address the ability of the generation and transmission resources in Southwestern PJM to continue to serve load reliably.

The extent to which Southwestern PJM continues to rely on transfers into the area to meet load-serving needs also has a definable, negative impact on the high voltage backbone transmission system on portions of the PJM transmission system west and northwest of the Baltimore and Washington metropolitan areas, as discussed in more detail in Section 3.3 of this report.

Map 3.2.1-1: Maryland and District of Columbia Transmission System

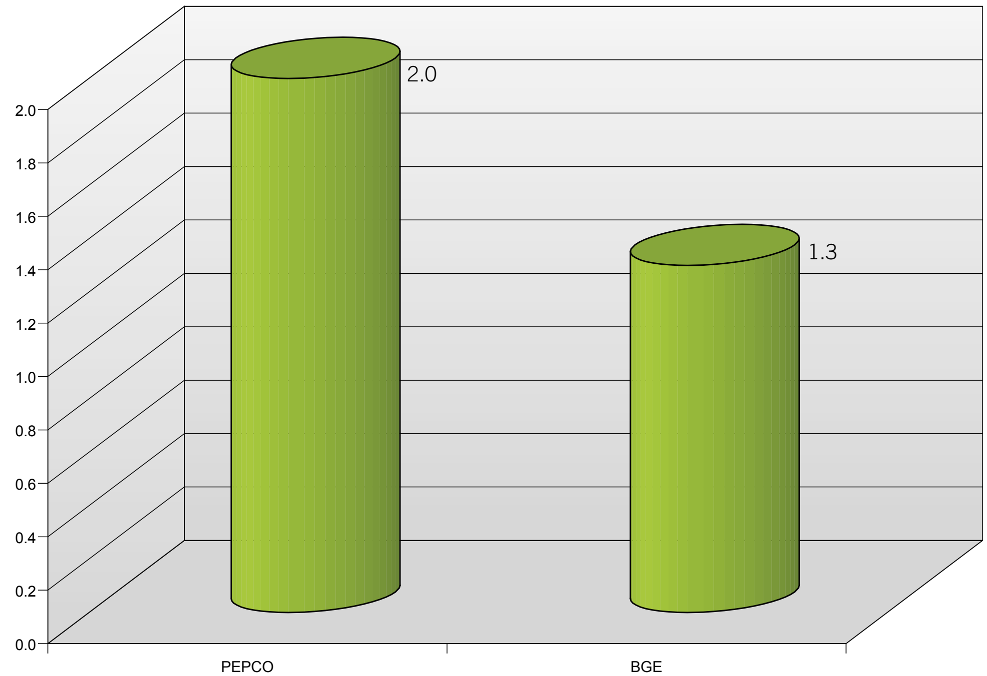


3.2.2 – Load Trends

One of the core principles of PJM's planning process is the integration of all drivers that impact grid infrastructure planning needs and all solutions available to meet those needs. Increasing forecasted load levels are a key, primary driver of generating resource requirements and transmission expansion plans. **Figure 3.2.2-1** shows the forecasted 10-year load growth rates for BGE and Pepco.

The weather normalized summer peak in Southwestern PJM is forecasted to grow at an average rate of 1.6% annually over the next ten years – from 13,459 MW in 2005 to 15,823 MW in 2015 – an increase of 2,364 MW over the intervening decade. BGE's forecasted individual load growth rate is 1.3% and Pepco's is 2.0%. Absent the capacity benefit that tie lines offer, this Southwestern PJM load growth, coupled with growing generation retirements and sluggish development of local generating resources, would otherwise cause reserve levels to continue to fall. RTEP-identified baseline reliability upgrades ensure PJM's ability to continue to serve load reliably.

Figure 3.2.2-1: PJM Summer Peak Load Growth Rate



3.2.3 – Generation Deactivations Impact Southwestern PJM Reliability

Deactivation of generation in the Baltimore / Washington D.C. area between 2003 and 2005 has totaled 585 MW, the result of plant retirements, unit environmental restrictions and other deactivations. Events in August 2005 suggesting the shut-down of the Potomac River generating plant account for 482 MW tagged for deactivation. (See Map 3.2.1-1 for location of Potomac River.) While currently in question, the final retirement date of this plant has not yet been established, pending owner Mirant's consideration of the plant upgrades needed to meet environmental standards. The deactivation of this unit in August 2005 has triggered immediate transmission expansion upgrades needs, including: 1) the installation of two new 230 kV circuits between Palmers Corners and Blue Plains; and, 2) an increase in the size of the dynamic reactive device at the Black Oak substation. These are summarized further in Section 3.2.5

NOTE

Both the interim status and final status of the Mirant Potomac River plant remain in flux as various state and federal regulatory and legislative bodies pursue the legal due process options at their respective disposal.

3.2.4 – Generation Interconnection Requests

Generating resource additions in the Baltimore / Washington area (and the rest of Maryland, for perspective), based on the interconnection request information in PJM's queues, are summarized in **Table 3.2.4-1** and seen in **Map 3.2.4-1**. These new generating resources are primarily the result of additions to existing generating plants between 1999 and 2005. No additional generation interconnection requests between 2005 and 2009 were received during the Queue O and Queue P request windows.

3.2.5 – Transmission Expansion Requirements

In addition to the upgrades identified in Section 3.2.3, above, required by the deactivation of the Potomac River generating plant in August 2005, ongoing baseline analyses since 1999 has also revealed the need for additional baseline reliability upgrades as well, as summarized in **Table 3.2.5-1** and shown in **Map 3.2.5-1**, in order to meet established PJM reliability criteria through 2010.

Again, however, the extent to which Southwestern PJM continues to rely on transfers into the area to meet load-serving needs also has a definable negative impact on the transfer capability of the high voltage backbone transmission system in other parts of PJM, notably that area of PJM's transmission system west and northwest of the Baltimore and Washington D.C. metropolitan areas, as discussed in more detail in Section 3.3.

Table 3.2.4-1: Maryland and D.C. New Generation

Queue	Project Name	MW	MWC	Status	Schedule	TO
G51_W62	Eastalco 230 kV	640	640	ACTIVE	6/30/09	AP
H23_W70	Kelso Gap 138 kV	100		UC	12/31/05	AP
I03_W74	Savage 138 kV	40		ACTIVE	12/1/07	AP
K25	Savage 138 kV	8	8	ACTIVE	6/1/06	AP
K28	Kelso Gap 138 kV	19.8	19.8	UC	12/31/05	AP
M19	Otter Point	4.5		UC	1/31/06	BGE
N29	Roth Rock 138 kV	40	8	ACTIVE	12/31/05	AP

Map 3.2.4-1: Location of Queued Generation Requests in Maryland and the District of Columbia

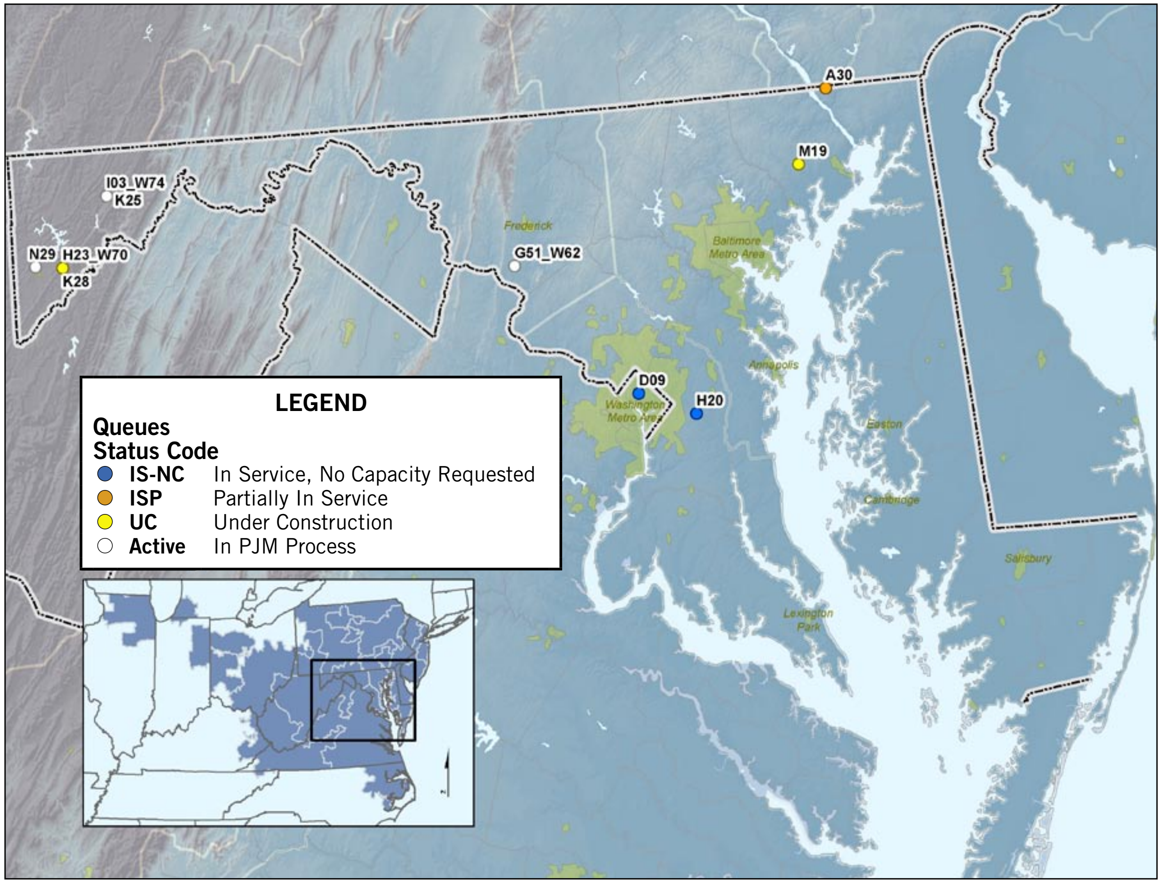


Table 3.2.5-1: Major RTEP Upgrades for Maryland and the District of Columbia

		System Upgrade Drivers: Baseline Upgrades				Network Upgrades		TOI Upgrade	Transmission Service				
Map Ref.	**Limiting Facility** / Upgrade Description	Baseline Load Growth/ Deliverability & Reliability	Congestion Relief – Economic	Operational Performance	Generator Deactivation	Generation Interconnection	Merchant Transmission Interconnection	TO – Local Issue	Long-term Firm Transmission Service	Date / Status	Cost	TO Zones	States
1	**Brandon Shores - Riverside**											BGE	MD
	New 230 kV Tower Line	X								January 2007	$ 7 M	BGE	MD
2	**Doubs 500/230 kV Transformer**											AP	MD
	Replace Doubs 500/230 kV Transformer #1	X								June 2006	$ 4.1 M	AP	MD
3	**Quince Orchard substation 230 kV Circuit Breakers**											PEPCO	MD
	Two new 230 kV circuit breakers at Quince Orchard substation on circuits 23028 and 23029	X								June 2006	$ 3.9 M	PEPCO	MD
4	**Install Two New 230 kV circuits between Palmers Corner and Blue Plains**											PEPCO	MD
	Install two new 230 kV circuits between Palmers Corner and Blue Plains	X			X					May 2007	$ 70 M	PEPCO	MD
5	**Piney Grove - Mt. Olive Circuit**											DPL	MD
	Piney Grove to Mt. Olive (6729) Rebuild							X		May 2009	$ 2.12 M	DPL	MD
6	**Loretto 138/69 kV Transformers**											DPL	MD
	Loretto AT-1 and AT-2 138/69 kV Replacements							X		May 2009	$ 2.8 M	DPL	MD

Table 3.2.5-1: Major RTEP Upgrades for Maryland and the District of Columbia, Continued

		System Upgrade Drivers – Baseline Upgrades				Network Upgrades		TOI Upgrade	Transmission Service				
Map Ref.	**Limiting Facility** / Upgrade Description	Baseline Load Growth/ Deliverability & Reliability	Congestion Relief – Economic	Operational Performance	Generator Deactivation	Generation Interconnection	Merchant Transmission Interconnection	TO – Local Issue	Long-term Firm Transmission Service	Date / Status	Cost	TO Zones	States
7	**Westport 115 kV Switching Station**											BGE	MD
	Build a new 115 kV switching station at Westport							X		June 2007	$ 42 M	BGE	MD
8	**Wattsville 138/69 kV Transformer**											DPL	MD
	Wattsville- Add a 138/69 kV autotransformer (200 MVA)							X		June 2009	$ 2.88 M	DPL	MD
9	**Lime Kiln 230 kV Substation**											AP	MD
	Install 230 kV bus with three 230 kV breaker terminals and eliminate #207 230 kV line junction							X		April 2006	$ 3.04 M	AP	MD
10	**Doubs Substation**											AP	MD
	Replace substation control building at Doubs Substation							X		November 2008	$ 3.97 M	AP	MD
11	**Quince Orchard 230 kV Circuit Breakers**											PEPCO	MD
	Installation of two additional 230 kV circuit breakers at Quince Orchard substation on circuits 23030 and 23031							X		June 2010	$ 3.5 M	PEPCO	MD
12	**Wye Mills 138/69 kV Transformer**											DPL	MD
	Wye Mills - 2nd 138/69 kV auto (200 MVA)							X		December 2010	$ 3.15 M	DPL	MD
13	**Northwest - Finksburg Circuit and Northwest Circuit Breaker**											BGE	MD
	Rebuild approximately 3.4 miles, from Northwest to Finksburg tap(110572) from single circuit to double circuit; install breaker at Northwest							X		December 2008	$ 3.5 M	BGE	MD

Section 3.3: PJM West-to-East Transfers

3.3.1 – West-to-East Transfers Influence Area Upgrades

The electricity needs of Southwestern PJM and Eastern PJM are supplied not only by local generation but also by energy transfers into those areas. A significant portion of these transfers flow through the interstate 500 kV, 345 kV and 230 kV transmission systems of northern West Virginia, northern Virginia, Maryland, eastern Ohio and southwestern Pennsylvania. These growing transfers, as well as emerging generation and load based trends, are driving the need for transmission upgrades for both baseline reliability and congestion constraints. PJM's RTEP addresses the transmission constraints of this area to ensure each LSE's ability to serve load reliably and enable members to participate in PJM's interstate regional wholesale markets for energy and ancillary services. Imbalances between supply and demand - the result of load growth, lagging generation additions and generation deactivations - require progressively more complex and expensive transmission upgrades.

Generation Resource Drivers

Reliable grid planning depends on the integration of generation adequacy and transmission adequacy. Case in point, certain recent generation deactivations have been announced within PJM under conditions of notice shorter than the long-lead times required for most types of transmission and generation installations. As a result, the transmission upgrade options for PJM to explore have been somewhat more limited. Nonetheless, the upgrades recommended, approved and presented here provide assurance that established reliability criteria will continue to be met. PJM RTEP studies show that existing and emerging generation scenarios are imposing heavier levels of power flow across PJM's interstate transmission system, primarily from west to east. New wind and coal-fired sources west of the Black Oak 500 kV substation, coupled with generation deactivations and minimal replacement generation east of Bedington substation, have revealed the need for a number of transmission enhancements for the PJM as-planned system through 2009.

More than 525 MW of new wind and coal-fired generating resources west of Bedington are expected to be online by 2009.

These new resources are being constructed both to serve local load and to participate in PJM's broader energy market to the extent that transmission capability permits. This energy will have the effect of displacing higher priced generation in PJM's merit order dispatch east of Bedington in the Baltimore/Washington area and in Eastern PJM as well.

A higher priced generation merit order east of Bedington is fundamentally driven by basic economics: 1) units fired by higher cost fuels 2) reduction in overall generation portfolio due to deactivations 3) decreasing generation replacement in key areas and 4) load growth (higher than system average).

The story is not complete, though, without coupling this generation scenario with anticipated load obligation trends.

NOTE

The economics of fuel cost fundamentally drive PJM's RTO merit-order generation dispatch. PJM typically sees higher priced generation in its eastern Mid-Atlantic region displaced by lower-priced generation, usually coal-fired, in PJM's Western Region to the extent transmission capability allows.

Load Obligation Drivers

The PJM RTO weather-normalized summer peak is forecast to increase at an average rate of 1.7% per year over the next ten years – from 2005 to 2015. Individual geographic zone growth rates vary from 1.1% to 2.5%, as shown in **Table 2.1.1-1**

RTEP planning studies show that in order to meet this load growth for the as-planned PJM system in 2009, the areas of southwestern PJM and eastern PJM must rely on the benefit of their tie lines to access needed energy. This same tie line import capability also provides the Baltimore / Washington D.C. area (as well as other parts of eastern PJM) the ability to access less expensive energy as well.

3.3.2 – Evolution of Specific Area Upgrade Plans

A number of specific upgrades planned for the resolution of operational performance reliability constraints also contribute to the mitigation of congestion along the interface where PJM's Mid-Atlantic, Western and Southern regions meet, in the area of western Maryland, southwestern Pennsylvania, northeastern West Virginia and eastern Ohio, as shown in **Map 3.3.2-1** and **Table 3.3.2-1**. The evolution of various system drivers themselves and need for specific upgrades warrant additional discussion.

The following facilities have been identified as limiting west-to-east transfers, from either a reliability or economic perspective. Each is discussed in more detail throughout the remainder of this section.

- Bedington – Black Oak 500 kV line
- Kammer 765/500 kV transformer
- PJM Central reactive transfer interface
- Fort Martin – Pruntytown 500 kV line
- Wylie Ridge 500/345 kV #5 & #7 transformer
- Mt. Storm – Doubs 500 kV line

Bedington – Black Oak 500 kV Line

The market window closed for this congested facility thermal and reactive limits in March 2005. PJM has confirmed that a merchant transmission project has been proposed that will increase the thermal limit of the circuit by replacing a limiting wave trap on the Bedington Black Oak line. This merchant transmission project constitutes a market solution. Replacing the wavetrap will raise the existing thermal limit on this circuit from 2744 MVA (35°C emergency rating) to 3214 MVA. A transmission owner replaced these wavetraps in November 2005.The reactive (voltage) limit is to be improved through the baseline reliability upgrade of installation of a -100/+525 MVAR dynamic reactive device prior to June 2008. This upgrade will reduce but not eliminate the congestion on this line.

Wylie Ridge 500/345 kV Transformers #5 and #7

RTEP analysis was completed on the Wylie Ridge Transformers #5 and #7 during market windows which closed on April 2005 and July 2005, respectively. The market windows closed without any solutions proposed by the market. Furthermore, the Wylie Ridge 500/345 kV transformers were also identified as an Operational Performance issue as a result of high levels of TLRs (greater than 100 per year). PJM recommended the Special Protection Scheme that was installed in the Spring of 2005 to mitigate the TLR activity on Wylie Ridge.

On August 11, 2005 the Wylie Ridge transformers were de-rated with the result that the benefit provided by the SPS was eliminated. PJM has designated the Wylie Ridge 500/345 kV transformers as an Operational Performance Issue again due to the resumption of TLRs experienced since the transformers were de-rated (34 events in the first month). The upgrade of coolers on Wylie Ridge #7 transformer by June 2006 will partially resolve the congestion.The recommended system upgrade to install a third Wylie Ridge 500/345 kV transformer by June 2007, will resolve the Wylie Ridge #5 and #7 transformer congestion issues.

Doubs – Mt. Storm 500 kV Line

Excessive loading on the Doubs – Mt. Storm 500 kV line was identified in the market window which closed November 29, 2005. The circuit was also identified as a reliability problem. Both the reliability and congestion issues are expected to be mitigated through an upgrade to the Doubs – Mt. Storm 500 kV circuit prior to the summer of 2006.

NOTE

Unhedgeable congestion above a certain threshold triggers a one year market window to permit system upgrade proposals to come forward to reduce congestion. If after one year there are no market proposed solutions, PJM will complete a cost / benefit analysis and depending on the results, recommend a system solution to relieve the congestion. Economic Planning issues are often early indicators of future Reliability issues if left unresolved.

PJM Central Interface / Juniata 500 kV

The PJM Central Interface includes the Keystone – Juniata 500 kV line, Conemaugh – Juniata 500 kV line, and the Conastone – Peach Bottom 500 kV line. Analysis of PJM's Central Interface power flows has revealed an excessive voltage drop at the Juniata 500 kV substation. The Central Interface voltage drop limitation was identified in the Economic planning window that closed November 2004. However, no market solution was proposed prior to identifying this same limit as a reliability problem in 2008. The recommended solution to the voltage drop limitation is to install, by June 2008, a 4% 230 kV series reactor at the low side of the Hunterstown 500/230 kV transformer and to install two 100 MVAR PLC switched capacitors at Hunterstown. PJM expects that future baseline studies for 2010 and beyond are likely to reveal the need for additional upgrades to mitigate this same limitation.

Harrison – Kammer Tap 500 kV Line

A market window closed in April 2005 for congestion on the Harrison – Kammer Tap 500 kV circuit based on a limit on the Kammer 765/500 kV transformer. No market solutions were proposed. The Kammer 765/500 kV transformer was derated in 2005 causing further significant unhedgeable congestion on the circuit. PJM cost/benefit analysis reveals that the benefit would not exceed the cost of the transmission solution. PJM baseline analysis does not reveal any reliability criteria violation through 2009 and therefore no RTEP baseline upgrade has been proposed at this time. PJM will continue to refine the cost / benefit analysis and look for solutions to cost effectively reduce this congestion.

Fort Martin – Pruntytown 500 kV Line

The Market Window for the Fort Martin - Pruntytown 500 kV circuit closed on December 1, 2005. A merchant transmission solution has been proposed to replace the 500 kV Disconnect Switch at Pruntytown by November 2006.

Doubs Voltage Support

PJM experienced voltage-based operational performance issues on July 27, 2005: low pre-contingency voltages at Doubs 500 kV substation and low post-contingency voltages in BG&E and PEPCO. Several area 500/230 kV transformers were also at their thermal capabilities. PJM's investigation concluded that factors driving this issue included the following: 1) several generators had reduced reactive capability for the summer of 2005; 2) differences in PEPCO's planning load model versus actual peak load system conditions; 3) differences in Dominion's planning load versus actual peak load system conditions; and 4) the combined effect of the high imports serving the PJM Mid-Atlantic Region and Dominion. PJM's RTEP Process identified system upgrades to be completed prior to June 2006 to provide additional voltage support and 500/230 kV transformation to help mitigate these reactive issues and other local thermal limits identified during 2005 peak load operations. With these upgrades completed, southwestern PJM, eastern PJM and Dominion will pass load deliverability tests for 2006. Upgrades identified to be complete by June 2006 included:

- 150MVAR capacitor at Loudon 500 kV
- 150MVAR capacitor at Asburn 230 kV
- 150MVAR capacitor at Dranesville 230 kV
- 33MVAR capacitor at Possum Pt 115 kV
- additional 500/230 kV transformer and 150MVAR capacitor at Clifton
- accelerate upgrade to Mt Storm – Doubs 500 kV line
- accelerate 360MVAR Waugh Chapel 500 kV capacitor
- increase size of Black Oak dynamic reactive device by June 2008

Map 3.3.2-1: Upgrades to Support PJM West-to-East Transfers

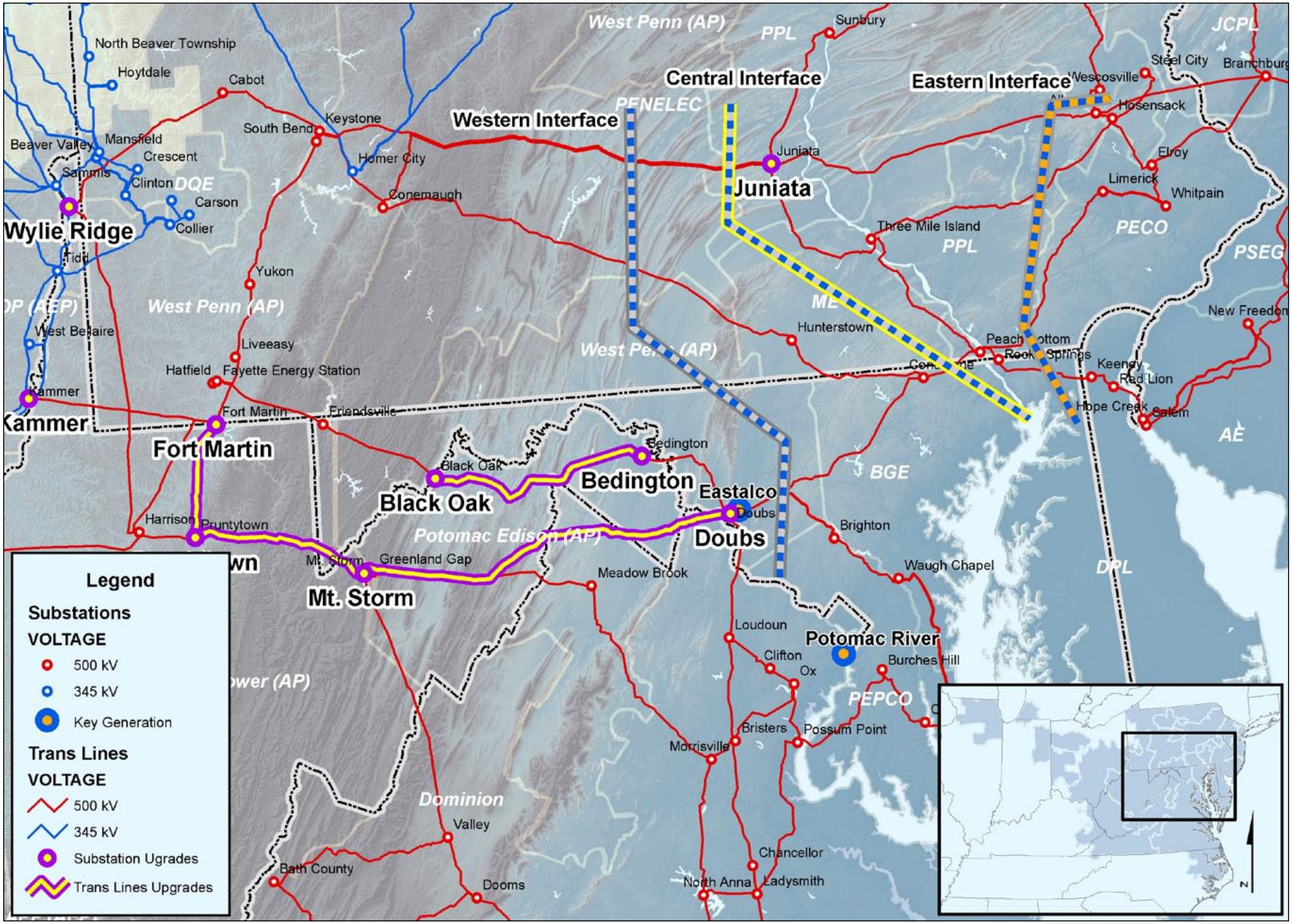


Table 3.3.2-1: Upgrades to support PJM West-to-East Transfers

		System Upgrade Drivers											
		Baseline Upgrades				**Network Upgrades**		**TOI Upgrade**	**Transmission Service**				
Map Ref.	**Limiting Facility** / Upgrade Description	Baseline Load Growth/ Deliverability & Reliability	Congestion Relief – Economic	Operational Performance	Generator Deactivation	Generation Interconnection	Merchant Transmission Interconnection	TO – Local Issue	Long-term Firm Transmission Service	Date / Status	Cost	TO Zones	States
1	**Bedington – Black Oak 500 kV Circuit**											AP	VA, WV
	Replace wave traps on Bedington - Black Oak line							X		November 2005	$0.08 M	AP	WV
	Replace wave traps on Bedington - Black Oak line						M05			ISA Stage	$0.08 M	AP	WV
	Install -100/+525 MVAR dynamic reatice device at Black Oak	X			X					June 2008	$35 M	AP	WV
2	**Wylie Ridge 500/230 kV Transformer**											AP	WV
	Install SPS at Wylie Ridge			X						March 2005		AP	WV
	Upgrade coolers on Wylie Ridge 500/345 kV #7			X						June 2006	$0.36 M	AP	WV
	Install third Wylie Ridge 500/345 kV transformer			X						June 2007	$12 M	AP	WV
3	**Mount Storm – Doubs 500 kV Circuit**											Dominion, AP	MD,VA,WV
	Upgrade Mt. Storm - Doubs 500 kV line rating	X			X					June 2006	$1.7 M	Dominion	MD,WV
4	**Juniata 500 kV Substation / PJM Central Interface**											METED, PPL	PA
	Install 230 kV series reactor and 2- 100MVAR PLC switched capacitors at Hunterstown	X			X					June 2008	$ 13 M	METED	PA
5	**Fort Martin - Pruntytown 500 kV Circuit**											AP	PA,WV
	Replace 500 kV Disconnect Switch at Pruntytown					O06				November 2006	$ 0.105M	AP	WV

PJM DE DC IL IN KY MD MI NJ NC OH PA TN VA WV

Section 3.4: Discussion Area #4 – Delmarva Peninsula

3.4.1 – PJM's RTEP Evolves to Address Delmarva Peninsula's Evolving Transmission Needs

Over the past six years, PJM has worked with Peninsula transmission customers, its TO and regulators to implement solutions on the peninsula to reduce congestion substantially. The flexibility of PJM's RTEP permitted new planning processes and tools to evolve to make this happen. PJM's regional planning process, its efficient markets facilitated by LMP price signals, and PJM's independent, reliable operation of the transmission system together have worked to cost effectively address congestion providing timely and efficient solutions to Delmarva's transmission needs.

The Delmarva Peninsula Transmission System

PJM's RTEP addresses Peninsula transmission needs to ensure each Load Serving Entity's (LSE) ability to serve load reliably and enable members to participate in PJM's interstate regional wholesale markets for energy and ancillary services. Although Delmarva Power & Light is the largest LSE on the Peninsula, other LSEs include Old Dominion Electric Cooperative, the Easton Maryland Utilities Commission and Occidental Power Services, Inc. Since its inception in 1999, PJM's regional planning protocol has maintained the principal objective of planning to maintain compliance with applicable reliability standards to ensure that these LSEs – and those across the entire PJM footprint – can continue to meet their load-serving obligations.

The topology of the Delmarva Peninsula's transmission system yielded a unique set of reliability and congestion system circumstances between 1998 and 2004. The transmission system matches the peninsular geography of the area, bounded on three sides by water. Several 500 kV and 230 kV transmission facilities to the north provide key links to the rest of the PJM system. Most of the transmission facilities on the Delmarva Peninsula are at 138 kV and 69 kV voltage levels, as well as some at 230 kV, as shown on **Map 3.4.1-1**. The 500/230 kV transformer banks at Keeney and Red Lion provide a key interface for transfers onto the Peninsula from markets served by the rest of the PJM transmission system backbone.

Evolving Planning Protocol Meets Growing Peninsula Transmission Needs

Between 1998 – 2004, collaborative efforts among PJM, Peninsula LSEs, Delmarva Power (TO) and regulators culminated in the enhancement of PJM's planning protocol to meet the unique reliability needs and economic constraints experienced by transmission customers on the Peninsula. These collaborative efforts helped all understand the scope of congestion caused by off-peninsula and on-peninsula drivers was explored including the impact of existing peninsula transmission outages on congestion. Such examination by PJM staff and discussion by stakeholders led to practical, targeted solutions.

The dovetailed evolution of transmission need and PJM planning protocol has yielded not only a more robust set of transmission upgrades but a more robust regional transmission planning protocol as well. Specifically, planning for merchant transmission interconnections was implemented in March 2003 and planning for economic upgrades was initiated in August 2003. These additional facets of PJM's planning protocol provided opportunities to enhance reliability further and mitigate unhedgeable congestion on the Peninsula. Indeed, the two are so interrelated that transmission upgrades initially identified and constructed to maintain reliability – based on a five-year forward planning horizon – also proved to offer solutions to mitigate transmission congestion constraints encountered during the interim as well. Even more so, this has demonstrated to PJM that transmission congestion events can often be harbingers of future baseline reliability upgrade needs.

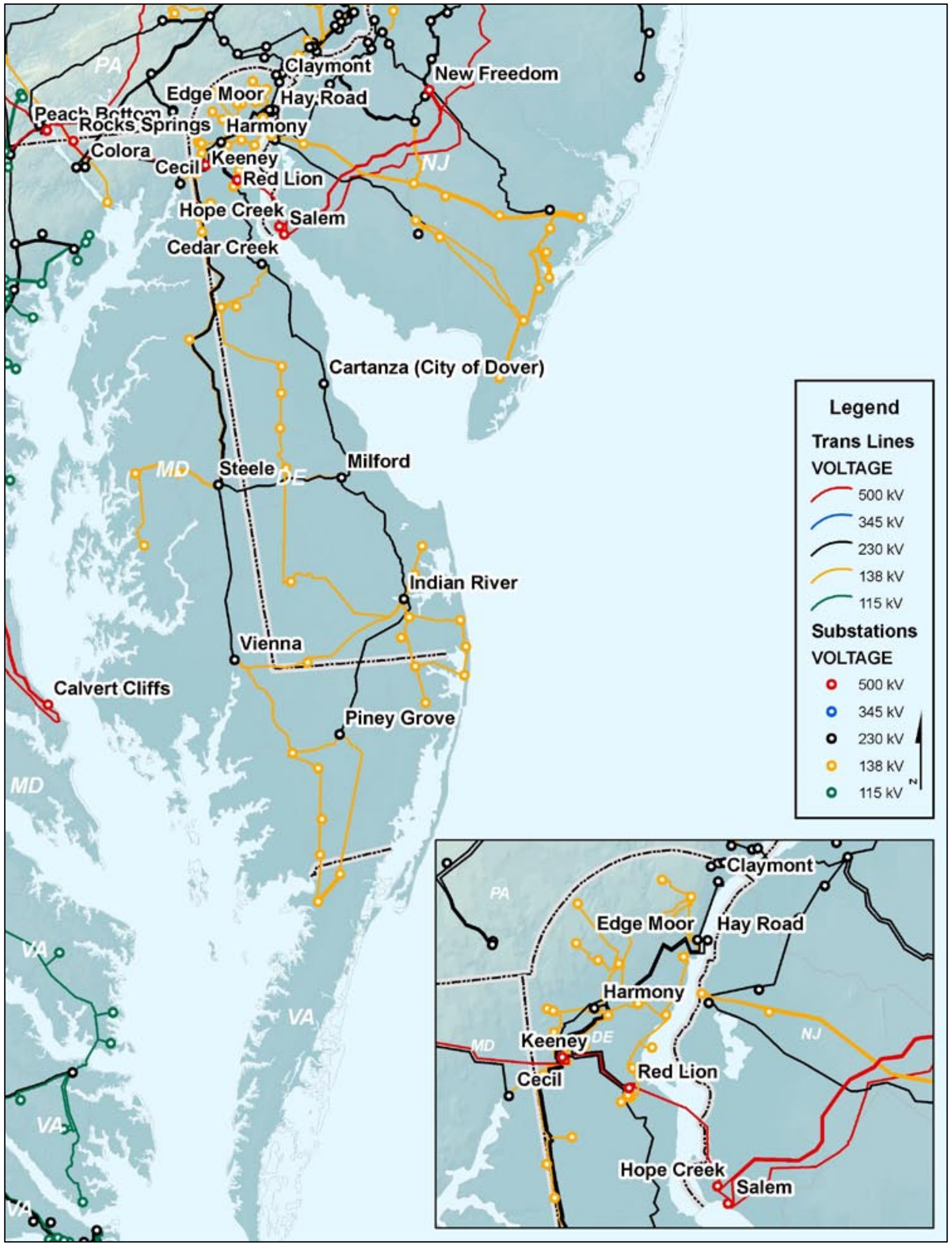
3.4.2 – Load Growth, Generation Trends and System Economics are Key Drivers of Delmarva Peninsula Upgrades

Minimal new generating resources, steady load growth and the economics of market-based system dispatch are driving the need for upgrades to the transmission system on the Delmarva Peninsula. More specifically, the need for baseline reliability transmission upgrades is primarily dependent on the relationship between load growth and generation growth. To that end, 2005 PJM RTEP studies have shown that load growth on the Peninsula is projected to be 2.7 percent per year, or an increase of 573 MW over the next five years. On the other side of the equation, planned generation additions are minimal. Over the same time period, only 14 MW are either in the process of being constructed or are in PJM's generation interconnection queue and are presently being studied. As a result, this generation/ load relationship imposes heavier base power flows on facilities throughout the peninsula, not only on the Keeney and Red Lion 500/230 kV transformer banks but on Delmarva's 230 kV, 138 kV and 69 kV systems as well.

Causes of Congestion

Higher capacity and energy purchases by Peninsula-based LSEs from broader PJM markets, as well as from bilateral arrangements with off-peninsula parties, has the effect of displacing higher cost generation resident on the Peninsula. As a result, transmission facilities can be more prone to congestion constraints. Thus, when least cost available energy off the Peninsula or from another part of the peninsula cannot be delivered to load in a given transmission-constrained area,

Map 3.4.1-1: PJM's Delaware / Delmarva Service Area



higher cost units in that area must be dispatched to meet load requirements. Simply put then, the difference in LMP between source and sink as a result of out-of-merit dispatch is congestion.

DEFINITIONS

LMP is the PJM acronym for Locational Marginal Price and is defined as the hourly integrated market clearing marginal price for energy at a given location that energy is delivered or received.

Summary of Transmission Investment to Date

Through the evolution of PJM's expansion planning process since 1997, some 50 upgrades alone between January 1, 1998 and May 31, 2003 were completed on the peninsula. These upgrades represent an investment of approximately $58 million, or about one-half of all investment in the PJM Mid-Atlantic area for network upgrades included in the RTEP during that period. More than $55 million of additional upgrades are presently in PJM's RTEP for the Delmarva Peninsula.

3.4.3 – Development of Peninsula Transmission Expansion Plans

A number of specific upgrades are included in PJM's RTEP to mitigate identified reliability, operational performance and congestion constraints discussed below and summarized in the accompanying tables and maps.

Planning for Baseline Reliability

Fundamentally, the principal objective of any expansion planning protocol is to maintain a transmission system's compliance with applicable reliability standards. From the outset, PJM's protocol has ensured that these standards are maintained, ensuring that LSEs can continue to meet the load-serving obligations of their customers. In fact, the initial scope of PJM's expansion planning process in the late 1990s centered on analysis of baseline reliability that included load deliverability studies and analysis of generator interconnection requests.

1998 – 1999: ISO Commences Operation and Congestion Issues are Identified

In January 1998, PJM commenced operation as an ISO. At that time, all 69 kV transmission facilities and most 138 kV transmission facilities on the Delmarva Peninsula were not under PJM's operational control; therefore, were not included in LMP calculations. As a result, wholesale customers served by those facilities would not have been directly exposed to the full costs of congestion. Generation interconnected with those facilities was dispatched out-of-economic-merit order to ensure the reliability of the transmission system as congestion constraints were encountered. Prior to 1999, congestion costs were socialized across all peninsula customers.

Effective July 1999, most 69 kV and all 138 kV facilities on the Peninsula were put under PJM's operational control. The transfer of those facilities to PJM's operational control meant that the costs of congestion on the 69 kV and 138 kV facilities were then reflected in Delmarva zone LMPs. LSE's receiving energy at those nodes experiencing higher LMPs bore the costs of redispatching Delmarva generation to control congestion as reflected in the varying locational prices on the Peninsula. Furthermore, market participants on the Peninsula had also historically purchased substantial amounts of energy and capacity from sources off the Peninsula. Therefore, they were subject to congestion as a result of facilities on the Delmarva Peninsula, as well as PJM facilities off the Peninsula.

1999 – 2002: Mitigating Congestion on the Peninsula

Congestion on the Peninsula peaked in 2000 and 2001 principally due to outages of transmission facilities. These outages were required to accommodate the construction of numerous transmission upgrades on the Peninsula for baseline reliability and to facilitate the interconnection of new generation facilities. PJM congestion studies for the Delmarva Peninsula for the period between August 1999 and August 2002 revealed that only 21% of congestion dollars were caused by non-outage related situations, i.e., other than construction, maintenance and forced outages. Specifically, the most significant non-outage congestion tracked from January 2002 through August 2002 occurred on the following facilities:

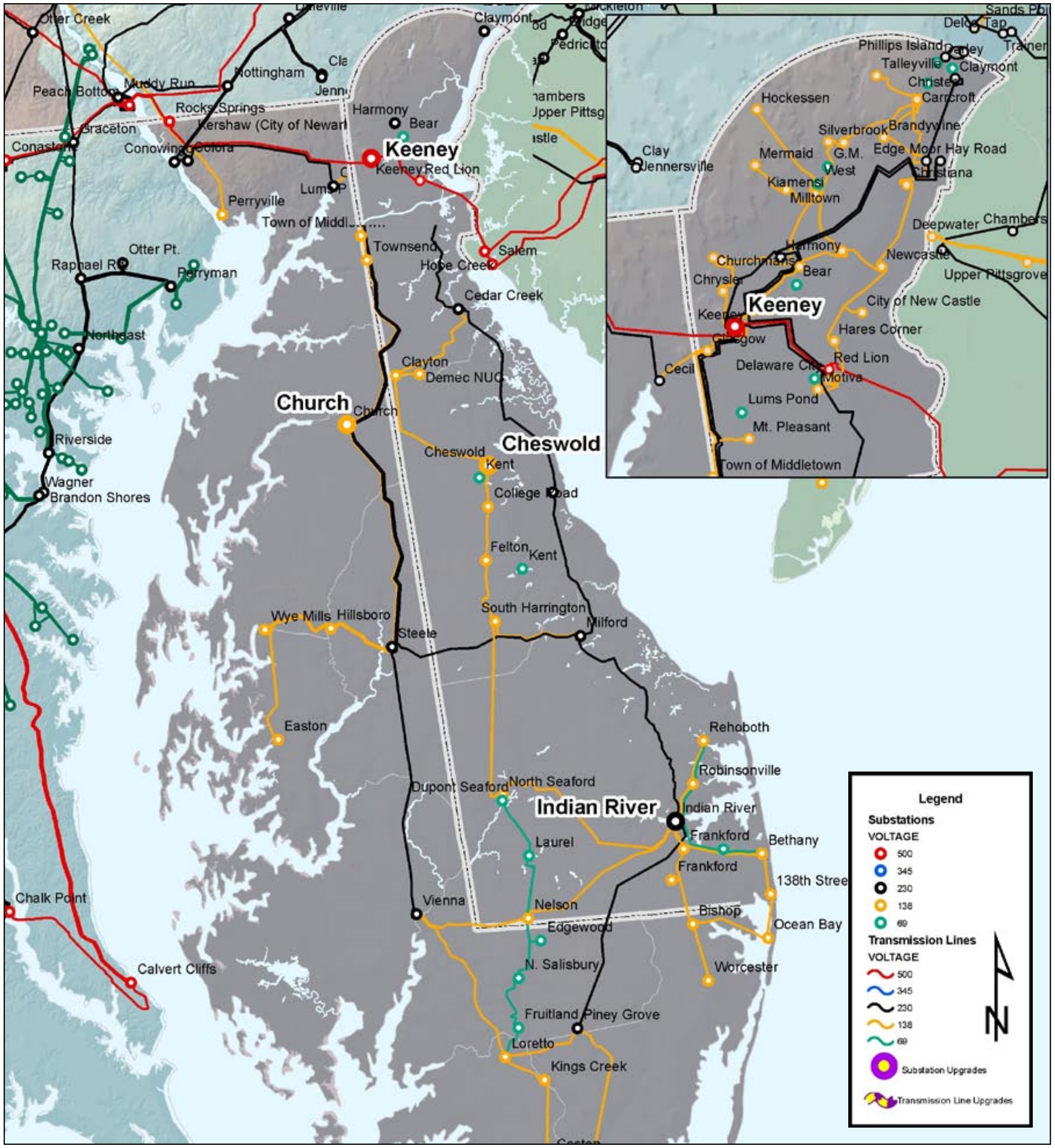
- Hallwood – Oak Hall 69 kV circuit
- Cheswold 138/69 kV transformer
- Church 138/69 kV transformer
- Indian River 230/138 kV transformer
- Keeney 230/138 kV transformer

Congestion on these facilities, however, would be mitigated by transmission solutions that had already been identified to relieve baseline transmission reliability constraints or to accommodate new generation interconnections, as shown in **Table 3.4.3-1** and **Map 3.4.3-1**.

Table 3.4.3-1: Delmarva Peninsula Upgrades

		System Upgrade Drivers											
		Baseline Upgrades				**Network Upgrades**		**TOI Upgrade**	**Transmission Service**				
Map Ref.	**Limiting Facility** / Upgrade Description	Baseline Load Growth/ Deliverability & Reliability	Congestion Relief – Economic	Operational Performance	Generator Deactivation	Generation Interconnection	Merchant Transmission Interconnection	TO – Local Issue	Long-term Firm Transmission Service	Date / Status	Cost	TO Zones	States
1	**Hallwood - Oak Hall 69 kV Circuit**											Delmarva	VA
	Oak Hall/Hallwood (6790) Upgrade	X						X		June 2000	$ 0.05 M	Delmarva	VA
	Added Second Oak Hall 138/69 kV Transformer	X						X		June 2002	$ 1.5 M	Delmarva	VA
2	**Cheswold 138/69 kV Transformer**											Delmarva	DE
	Replace Cheswold 138/69 kV Transformer							X		May 2004	$ 2.057 M	Delmarva	DE
3	**Church 138/69 kV Transformer**											Delmarva	DE
	Replace bushings on Church AT-1 138/69 kV Transformer	X						X		June 2002	$ 0.03 M	Delmarva	DE
	Replace Church 138/69 kV Transformer							X		June 2003	$ 1.5 M	Delmarva	DE
4	**Indian River 230/138 kV Transformer**											Delmarva	DE
	Install a second 230/138 kV Transformer at Indian River	X								June 2004	$ 5.04 M	Delmarva	DE
5	**Keeney 230/138 kV Transformer**											Delmarva	DE
	Replace Keeney 230/138 kV Transformer							X		March 2003	$ 2.02 M	Delmarva	DE

Map 3.4.3-1: Delmarva Peninsula Transmission System



March 2003: Implementation of PJM's Merchant Transmission Interconnection Process Encourages Transmission Investment Proposals on the Peninsula
In March 2003, PJM integrated a merchant transmission interconnection process into its broader expansion planning protocol. This encouraged market funded projects to be proposed to mitigate congestion on the Delmarva Peninsula. Historically, transmission systems have been built by vertically integrated utilities with franchised territories and paid for out of the customer rate base. PJM's merchant transmission process provided opportunities for local and non-local entities to propose new or upgraded transmission assets through non-rate base funding. Having moved to an LMP structure, market signals now provided even greater economic incentive for transmission investment encouraging competition with new generation to provide low cost energy, as well as demand side response, all based on the system economics in the area.

Within a short time of finishing development of appropriate business rules, a number of merchant transmission proposals were submitted and posted to PJM's newly established merchant transmission queues. Those proposals are summarized in **Table 3.4.3-2** and shown on **Map 3.4.3-2**.

NOTE

One of the primary analyses that has revealed the need for the reliability-based Delmarva transmission upgrades is load deliverability testing. These tests evaluate the ability of the transmission system to deliver energy to load during peak summer periods under conditions of greater-than-normal generating capacity unavailability. Even more so, transmission improvements that enhance the ability to deliver energy to load under such conditions will also enhance the ability of the transmission system to deliver energy to load during conditions that would otherwise have caused congestion as well.

Map 3.4.3-2: Delmarva Peninsula - Merchant Transmission Proposals Highlighted

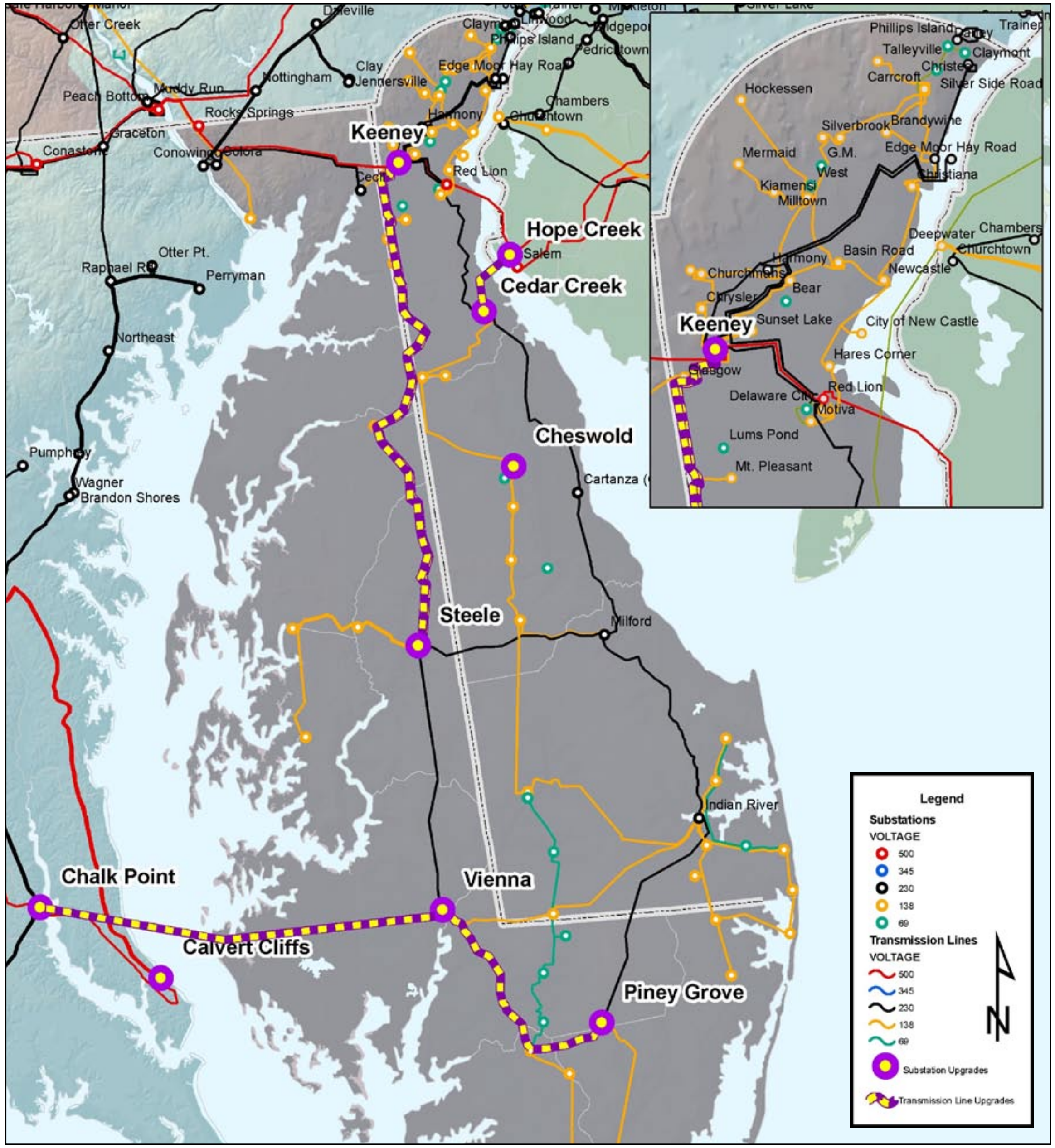


Table 3.4.3-2: Merchant Transmission Upgrades on the Delmarva Peninsula

		System Upgrade Drivers											
		Baseline Upgrades				Network Upgrades		TOI Upgrade	Transmission Service				
Map Ref.	**Merchant Transmission Facility** / Upgrade Description	Baseline Load Growth/ Deliverability & Reliability	Congestion Relief – Economic	Operational Performance	Generator Deactivation	Generation Interconnection	Merchant Transmission Interconnection	TO – Local Issue	Long-term Firm Transmission Service	Date / Status	Cost	TO Zones	States
1	**Keeney - Steele 230 kV Circuit**												DE, MD
	Keeney-Steele 230 kV						G00_ MTX2B			Not Implemented			DE, MD
2	**Vienna - Piney Grove 230-138 kV Circuit**												MD
	Vienna-Piney Grove 230 kV						G00_ MTX2C			Not Implemented			MD
3	**Chalk Point - Calvert Cliffs High Voltage Circuit**												MD
	Vienna 230 kV - Chalk Point 230 kV						J02_ MTX11			Not Implemented			MD
4	**Hope Creek - Salem High Voltage Circuit**												DE, NJ
	Hope Creek 500 kV Cedar Creek 230 kV						J01_MTX			Not Implemented			DE, NJ
5	**Keeney 230/138 kV Transformer Acceleration**											Delmarva	DE
	Replace Keeney 230/138 kV Transformer						J02_ MTX13			December 2003	$ 2.1 M	Delmarva	DE
6	**Cheswold 139/69 kV Transformer Acceleration**											Delmarva	DE
	Cheswold 138/69 kV Transformer						J07_ MTX12			December 2003	$ 1.9 M	Delmarva	DE

Economic Planning Process and Additional Upgrades

In August 2003, PJM implemented an economic planning process to permit competition among alternative solutions for transmission congestion: generation, merchant transmission and demand response measures. PJM's approach is based on the premise that, where congestion can be hedged with market measures, customers have a range of choices for managing their congestion exposure. In such instances, market forces should enable generation resources, merchant transmission projects and demand side measures to provide competitive alternatives to LSEs' use of hedging instruments and/or continuing to bear the costs of congestion.

To enable market participants to evaluate congestion events, PJM proactively identifies areas with high historical unhedgable congestion on the transmission system. PJM will determine a transmission solution to the problem and, subject to cost/benefit analysis, will recommend its implementation through the RTEP if no solution has been proposed by a market participant within a one-year window. PJM's approach is to give market forces an opportunity to determine whether transmission investment beyond that needed to ensure reliability is warranted. **Table 3.4.3-3 and Map 3.4.3-3** include the recent identification (since March 2004) of upgrades identified through PJM's economic planning process at the conclusion of the one-year window. **Table 3.4.3-4** summarizes the identification of facilities for which the one-year has recently closed or will do so in 2006.

Map 3.4.3-3: Delmarva Peninsula - Economic Planning Upgrades Highlighted

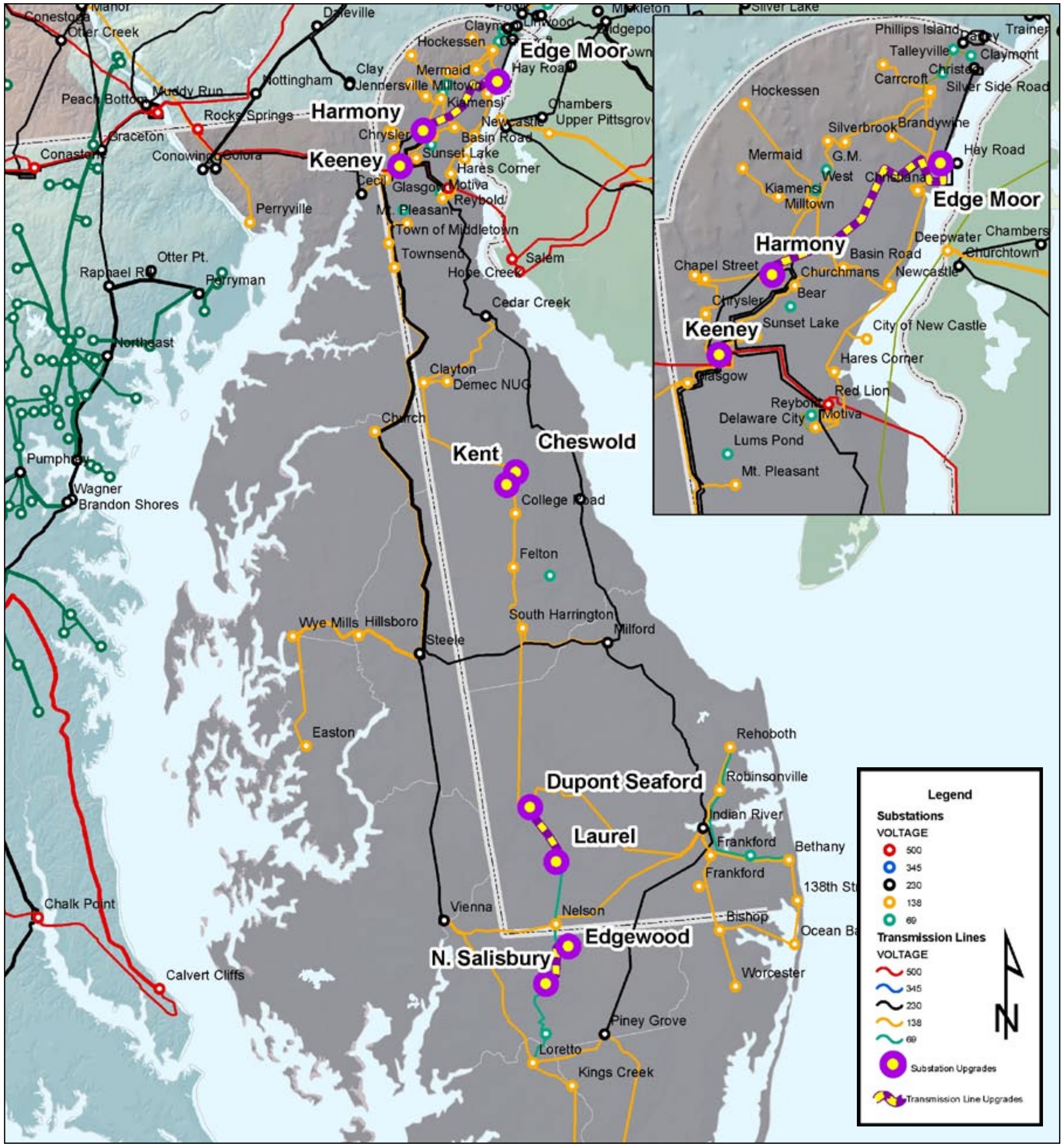


Table 3.4.3-3: Additional Upgrades on the Delmarva Peninsula

		System Upgrade Drivers											
		Baseline Upgrades				Network Upgrades		TOI Upgrade	Transmission Service				
Map Ref.	**Limiting Facility** / Upgrade Description	Baseline Load Growth/ Deliverability & Reliability	Congestion Relief – Economic	Operational Performance	Generator Deactivation	Generation Interconnection	Merchant Transmission Interconnection	TO – Local Issue	Long-term Firm Transmission Service	Date / Status	Cost	TO Zones	States
1	**Edgewood - N. Salisbury 69 kV Circuit**											Delmarva	MD
	Replace disconnect switch on Edgewood - N. Salisbury 69 kV		X							June 2006	$ 0.02 M	Delmarva	MD
2	**DuPont Seaford - Laurel 69 kV Circuit**											Delmarva	DE
	DuPont Seaford to Laurel (6736) Upgrade Phase 1							X		October 2005	$ 0.124 M	Delmarva	DE
	DuPont Seaford to Laurel (6736) Upgrade Phase 2							X		May 2009	$ 2.516 M	Delmarva	DE
3	**Keeney 500/230 kV Transformer, AT51**											Delmarva	DE
	Red Lion 500/230 kV Transformer	X								Did not pass cost/benefit analysis screen		Delmarva	DE
4	**Red Lion - Milford 230 KV Circuit**											Delmarva	DE
	Build new Red Lion – Milford – Indian River 230 kV circuit	X								June 2006	$ 44.91 M	Delmarva	DE
5	**Indian River 230/115 kV Transformer**											Delmarva	MD
	Install a second 230/138 kV transformer at Indian River	X								June 2004	$ 5.04 M	Delmarva	DE

3.4.4 – Going Forward

PJM believes that the congestion on the Peninsula has been substantially reduced and that, barring unforeseen events, is likely to remain at reasonable levels during the present PJM planning horizon. PJM's regional planning process, its efficient markets facilitated by LMP price signals, and PJM's independent, reliable operation of the transmission system together to cost-effectively address congestion, offering timely and efficient solutions to Delmarva's transmission needs.

Presently, PJM is also working to integrate into its planning process provisions to accommodate behind-the-meter generation, distributed generation and demand-side management measures to offer an even wider range of alternatives from which to choose congestion management solutions.

Table 3.4.3-4: Delmarva Peninsula Market Window (12/31/05)

One Year Market Window	Market Window Open Date	Market Window Close Date	Location of Facility Based on Transmission Owner Zones	Status
Glasgow - Mt Pleasant 138 kV	11/29/04	11/29/05	Delmarva	Cost Benefit Analysis of Potential Solutions
Red Lion 500/230 kV "AT50"	11/29/04	11/29/05	Delmarva	Cost Benefit Analysis of Potential Solutions
Wye Mills 138/69 kV "AT-2"	11/29/04	11/29/05	Delmarva	Cost Benefit Analysis of Potential Solutions
Talbot-Trappe 69 kV	11/29/04	11/29/05	Delmarva	Cost Benefit Analysis of Potential Solutions
Edgemoor - Harmony 230 kV	3/2/05	3/2/06	Delmarva	Window Open for Proposed Market Solution
Cheswold - Kent 69 kV	12/20/05	12/20/06	Delmarva	Window Open for Proposed Market Solution
Edgemoor 230/138 kV "AT20"	12/20/05	12/20/06	Delmarva	Window Open for Proposed Market Solution